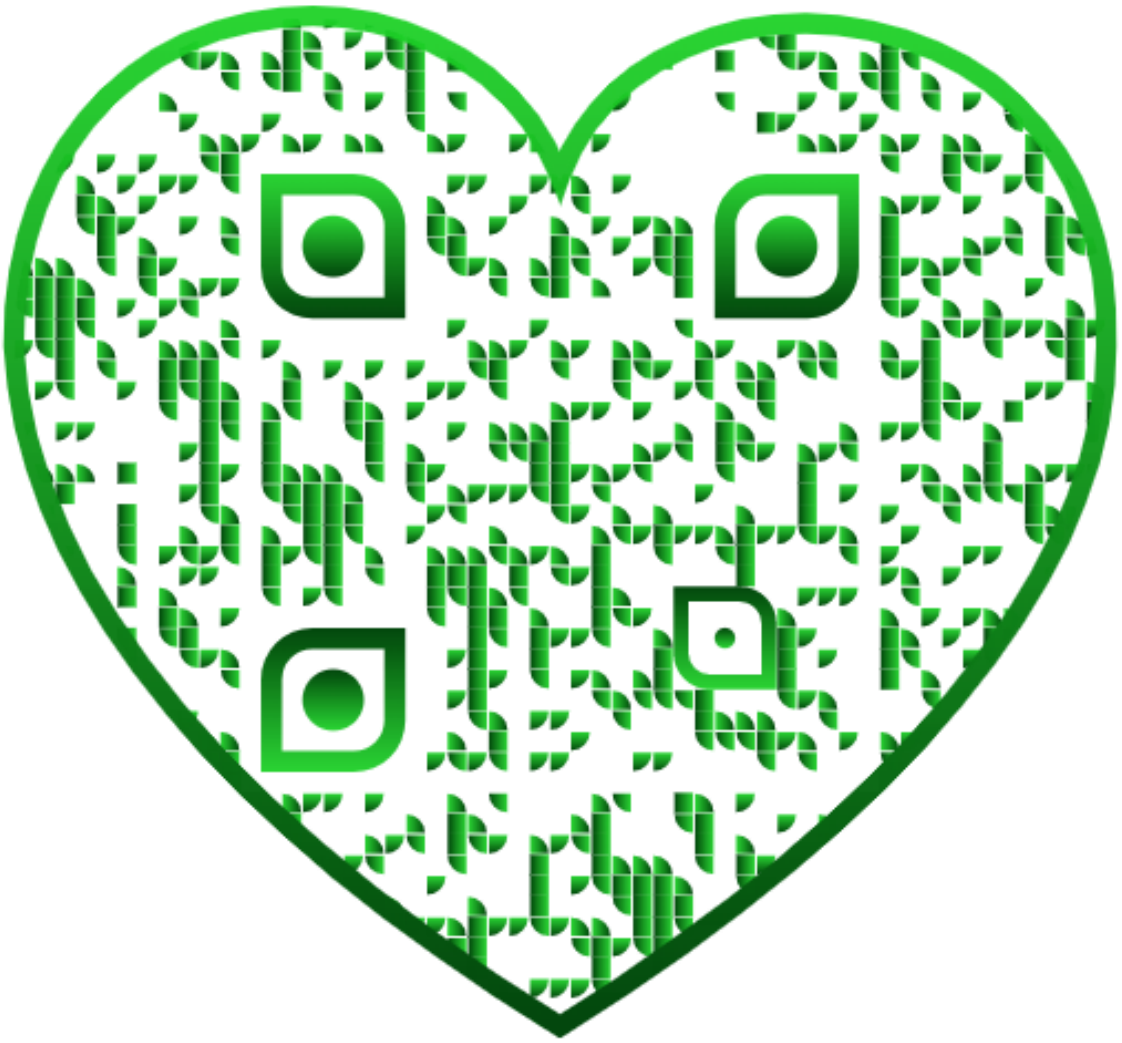
MARIO BEAUREGARD

EXPANDING REALITY

THE EMERGENCE OF POSTMATERIALIST SCIENCE



What people are saying about

Expanding Reality

In *Expanding Reality*, neuroscientist Mario Beauregard presents the impressive body of scientific evidence that our familiar materialistic model of the world is locked into a sadly outdated 19th century philosophy. Whether or not you agree with all his conclusions, this courageous book will challenge you to rethink how we see ourselves and our world – and may help usher in a new scientific revolution.
Bruce Greyson MD, Carlson Professor Emeritus of Psychiatry & Neurobehavioral Sciences Division of Perceptual Studies University of Virginia Health System

As Dr. Mario Beauregard clearly and convincingly presents in *Expanding Reality*, science is experiencing another paradigm change whose revolutionary implications may be immense.
Gary E. Schwartz PhD, Professor of Psychology, Medicine, Neurology, Psychiatry and Surgery; Director, Laboratory for Advances in Consciousness and Health, University of Arizona

Science seeks to understand the nature of reality. But science rests upon many assumptions, some of which are incorrect and have caused science to derail. To help put science back on track, Mario Beauregard provides a clear and comprehensive survey of "postmateralistic" evidence and concepts. Read *Expanding Reality* to gain a thrilling glimpse of what is likely to become the foundations of 22nd century science.
Dean Radin PhD, Chief Scientist, Institute of Noetic Sciences, Associated Distinguished Professor, California Institute of Integral Studies, author of *Supernormal* and *Real Magic*

In *Expanding Reality*, Dr. Mario Beauregard lays the foundation for the next great scientific revolution, the revolution beyond scientific materialism. The reader is guided through the comprehensive scientific evidence for postmaterialism in a clear and digestible way, emerging enlightened by the science of consciousness. *Expanding Reality* breaks the chains of an outdated paradigm to usher in a new world in which we understand our interconnection and embrace our divine nature. A must-read for anyone yearning for an evolution in human consciousness.
Natalie Leigh Dyer PhD, Research Scientist at Kripalu Center for Yoga & Health and at University Hospitals Connor Integrative Health Network

In this very interesting and important book the overwhelming clinical, empirical and statistical evidence is shown that consciousness must be fundamental, and that conscious experiences cannot be fully understood due to the current widely accepted materialist paradigm in Western science. There is no scientific method whatsoever to objectify nor prove the content of our subjective consciousness. Unfortunately, a significant part of society remains under the influence of a mechanist, materialist and reductionist view of the world, and this has hindered and delayed the development of scientific studies about consciousness. In this wonderful book Mario Beauregard describes many studies about transcendent conscious experiences, nonlocal phenomena (beyond time and space) such as telepathy, remote viewing, precognition, presentiment, and mental influence on physical systems. He discusses how during meditation or in placebo treatment the mind can influence the function and structure of the brain (neuroplasticity), and how the mind can also change the activity of our genes (epigenetics). He writes about experiences of enhanced consciousness around the deathbed as well as after death, and also about proven cases of reincarnation. These studies support the idea of the continuity of consciousness after physical death. Postmaterialist science is based on the undeniable fact that consciousness is fundamental in the universe, and that it is a prerequisite for reality. We mostly do not realize anymore that the world, as we see it, only derives its “subjective” reality from our state of consciousness. Because it is only our consciousness that is determining how we perceive the reality in this world. So we have to change and expand our ideas about the nature of reality by changing our ideas about the function of the mind, with a better access to,

and acceptance of, the “higher” dimensions of our consciousness. This will lead to a profound transformation of all aspects of life on our endangered planet. Highly recommended.
Pim van Lommel, cardiologist, NDE-researcher, author of *Consciousness Beyond Life*

Expanding Reality

The Emergence of Postmaterialist Science

Mario Beauregard

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BOOKS

Winchester, UK

Washington, USA

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Foreword

Gary E. Schwartz, PhD[1]

If at first an idea is not absurd, then there is no hope for it.
Albert Einstein

May this book transform your life by finally liberating you from the materialist straitjacket.
Mario Beauregard

The history of science reminds us that science is, first and foremost, a careful step by step process of creative discovery and application. As Ted Arroway, a character in the 1997 movie *Contact* said to his budding young daughter and future astrophysicist, Dr. Ellie Arroway, "small moves, Ellie, small moves."

However, every now and again, scientists take "small steps" that prove to be "giant leaps" for the evolution of human understanding and life in general. Thomas Kuhn, the distinguished historian and philosopher of science, called these revolutionary transformations in human understanding "paradigm changes."

Interestingly, in each instance the revolutionary "small" step/idea was "simple" and frameable in a single sentence even though its giant implications and applications were complex and far reaching. These revolutionary ideas and implications challenged the prevailing established beliefs, and they were typically perceived by most of the scientists and public in their day as being wrong, impossible, and even "absurd."

Historical examples of small/simple steps that have become giant/transformative leaps for humanity include:

1. The idea that the earth is round
2. The idea that the earth revolves around the sun
3. The idea that time and space are relative, and
4. The idea that seemingly solid matter is composed of quanta of energy whose properties defy common sense and experience

As Dr. Mario Beauregard clearly and convincingly presents in *Expanding Reality: The Emergence of Postmaterialist Science*, science is experiencing another paradigm change whose revolutionary implications may be even more transformative for science and society than 1-4 above. Not only are the implications of postmaterialist science far reaching for humanity, they have the potential to resolve the historic as well as contemporary war between science and religion, and in the process, enhance the prospect for global healing and peace.

The small step that is a giant leap for humankind is:

5. The idea that consciousness is a core property of universe, not only on a par with physical fundamental properties – e.g., information, energy, and matter – but even more primary.

It is virtually impossible to read Beauregard's comprehensive and engaging presentation of the emergence of postmaterial science and not see reality in a new, expanded way. Like Beauregard's previous books, *The Spiritual Brain* and *Brain Wars*, *Expanding Reality* provides a delicious four course meal of historical context, scientific evidence, personal perspective, and big picture analysis that leaves the reader in a state of wonder, awe, and hope.

I was inspired to contact Dr. Beauregard after reading his previous books. We quickly discovered how similar and complementary our emerging perspectives were, and I invited him to join me and Lisa Miller in organizing the International Summit on Postmaterialist Science, Spirituality, and Society held in Tucson in February 2014. This visionary meeting – Mario calls it a "Pivotal Event"– resulted in many practical collaborative products, including a book edited by Mario Beauregard, myself, Natalie Dyer, and Marjorie Woollacott titled *Expanding Sciences: Visions of a Postmaterialist Paradigm*.

It takes knowledge, skill, vision, inspiration, and courage to write a big

picture book whose topics range from “Thoughts that Transform the Body” (Chapter 1) to “Journeys to the Source” (Chapter 8). Like other paradigm-changing books in the history of science, *Expanding Reality* will receive both praise and distain. Speaking bluntly, some readers will love this book and others will despise it. This extreme diversity of opinion comes with the territory, as the author of *Brain Wars* knows firsthand.

In my chapter in *Expanding Science* titled “Extraordinary Claims Require Extraordinary Evidence: The Case for Postmaterial Consciousness,” I discuss what I call the Kepler Challenge as expressed by Dr. Carl Sagan, the distinguished astronomer and skeptic.

> *When he [Johannes Kepler] found that his long-cherished beliefs did not agree with the most precise observations, he accepted the uncomfortable facts.*
>
> *He preferred the hard truth to his dearest delusions, that is the heart of science.*

Dr. Beauregard encourages us to be genuine truth seekers. He invites us to practice – and celebrate – the “heart of science,” and thereby be liberated from the straitjacket of materialism. Once again, it is time for us to expand our hearts and minds.

Introduction: The Downfall of Scientific Materialism

Consciousness cannot be accounted for in physical terms, for consciousness is absolutely fundamental. It cannot be accounted for by anything else.
Erwin Schrödinger

The Essence and Origin of My Research

Certain members of the general public, as well as journalists, sometimes inquire as to why I conduct research on consciousness, transcendental experiences and brain-mind relationships.[2] Until now, eager to protect my reputation, I have remained vague on the subject. As this no longer matters, I have decided to be honest and address those questions in this book.

As a scientist, empirical evidence related to my research has been crucial in the key thematic areas addressing specific sectors of my research program. This observation, or experimentation-based evidence, is analyzed in the chapters that follow. However, to be honest, my work as a researcher has been primarily influenced by significant first-hand spiritual experiences at various instances in my life.

Since I do not consider myself a guru and do not wish to risk marginalization, this book will not focus on these experiences. I do need, however, to mention some of them briefly to shed some light on me and my roots. The first one occurred when I was only eight years old.

My parents' farm was found near a vibrant and mysterious forest, which I explored every now and then. On one beautiful summer day back in 1970, I ventured into the entrancing woods. It was hot, and after walking for some time, I realized I was exhausted. I sat down on a large grey rock and gazed at the magnificent trees around me. After a few minutes, I started to feel a strong connection with the trees and the rock – I could sense that they were imbued with life. It felt like the rock, the trees and I were part of a much

larger whole, much bigger than my “small self.” My life’s goal became very clear following this powerful experience – I would become a scientist who would help demonstrate that the human essence is not determined by the brain.

Some twelve years later, a new life cycle began for me. This new cycle was also marked by various determining spiritual experiences. It was new, as until then, I had been blessed with perfect health. Not anymore.

One January morning in 1982, I woke up to find that my body was not functioning like it did the day before, and that my visual perception was dramatically altered. I felt completely drained of energy, and my stomach, back, and multiple joints were hurting. I also felt dizzy and nauseated, and my breathing was labored. I was experiencing a kind of mental fog and my visual perception of the outside world was not the one I was used to. In fact, all the objects in my line of vision seemed to be continuously whirling.

I felt way too sick and weird to attend my classes at university. I did not understand what was happening, but I was convinced that it was something serious. The next evening, I called my parents to tell them about my predicament. They asked me to return home as quickly as possible – which I managed to do the very next day, after gathering all my willpower, but not without difficulty and misery.

I stayed in bed for almost a year. Weak and barely feeding myself, I had no other choice than to temporarily drop out of university.

My parents were desperate and utterly helpless. We agreed that we had to find the underlying source of my condition, which might be the solution to my problem.

My mother took me to see several medical specialists, including a neurologist, a psychiatrist, an ophthalmologist, a gastroenterologist and an internist. Some of these doctors decided not to further the investigation, dismissing me as a hypochondriac. One doctor, claiming I was showing signs of schizophrenia, prescribed an antipsychotic which I threw out right away. The other medical specialists, puzzled by the mysterious accumulation of my symptoms, subjected me to a battery of tests – all negative.

I could feel myself slowly withering away and I could not reconcile what I was going through with the experience that had left such a mark on my childhood. It did not seem to make any sense and it filled me with bitterness – I would never be able to accomplish my life’s mission in such a deplorable state. I found myself in a very dark place and suicidal thoughts started to

creep into my consciousness – I could not live like this anymore.

One evening, I was so desperate that I mentally bellowed at the sky. Apparently, my supplication did not fall on deaf ears, as a few days later, in the middle of the night, I suddenly felt that I was leaving my physical body through my heart. I then sensed a Being of Light, radiating immense and unconditional love. The Being of Light reassured me telepathically that what I was experiencing was no disease, but rather a process of transmutation. He also told me that I was not alone and that I had to hang in there. Moreover, to restore my confidence, this Being of Light told me about events that would take place shortly, and he also mentioned that the severity of my symptoms would gradually decrease over the following months. All the Being of Light's predictions came true. Many other things happened during this life-defining episode, but I will not mention them as the main purpose of this book is not to share my personal experiences.

After that, I mustered enough strength to resume my studies, and my symptoms faded slowly but surely, just like the Being of Light had predicted. Still, getting back on my feet was no easy task.

Seven years after my health problems first started, a friend introduced me to a famous doctor and microbiologist at the Hôtel-Dieu Hospital in Montreal. The latter performed a thorough battery of medical tests. He detected the presence of viral agents in my body – the Epstein-Barr virus, cytomegalovirus and Coxsackie virus. Together, these viruses could explain most of my symptoms. I also learned that I had cerebral vasculitis, an inflammation of the blood vessels of the brain. The severity of the viral infections left the microbiologist bemused as to how I had managed to remain on my feet and continue with my studies.

It took me twelve long years to get back in perfect health. During this life cycle, my psychic faculties developed remarkably, and I have remained in close contact with the spiritual world since this lengthy episode.

I saw the microbiologist again one last time when everything was over. He told me that there was no explanation for my remission, which was simply "miraculous," from a medical point of view.

Science is Not Tantamount to Materialism

It may seem surprising to many readers, but most contemporary men and women of science are unaware that the "modern scientific worldview" is

largely based on metaphysical assumptions, that is, assumptions about the nature of reality.[3] These assumptions were first put forward by ancient Greek philosophers who preceded Socrates. These philosophers, referred to as "Pre-Socratic," proposed several interesting ideas and theories that are now available to us.

At first glance, this crass ignorance, which also characterized many scientists from previous generations, may not seem so important. However, this is not the case, as such ignorance has had considerable negative impacts. Indeed, this ignorance is largely responsible for the delay of science in the fields of research related to human interiority. This becomes evident if we take as a point of comparison scientific fields geared towards technological development. Furthermore, it is this ignorance that has made most scientists prisoners of an ideological trance that has lasted a few centuries. This is hardly surprising since knowledge, especially when disinterested, is the best antidote against ideology.

Several centuries after the Pre-Socratics, the philosophical postulates, which formed the vision of the modern scientific world, became associated with classical physics. These postulates include *materialism*, the idea that matter is the only reality and that everything in the universe is composed of sets of material particles and physical fields[4] – as well as *reductionism*, the notion that complex things can only be understood by reducing them to the interaction of their parts or to simpler or more basic things, such as material particles. Other postulates include *determinism* – the idea that future states of physical or biological systems can be predicted based on their present states – and *mechanism*, the notion that the world functions as a huge machine determined by immutable physical laws.

For the founding fathers of classical physics – such as Galileo, Descartes and Newton – these philosophical postulates were useful hypotheses that could guide them in their exploration of the material world. However, these pioneers of modern science, who were also spiritual men, did not believe that the world could be reduced only to its material dimension. But this crucial nuance ends up being forgotten by their successors, and during the nineteenth century, the postulates in question were changed into dogmas and united to form a system of beliefs that became known as "scientific materialism."

This belief system implies that our consciousness and everything we experience subjectively – for example, our perceptions, our thoughts, our emotions, our memories, our free will, our sense of personal identity and our

spiritual illuminations – is identical or can be reduced to electrical and chemical processes taking place in our brain. Moreover, scientific materialism posits that our thoughts cannot affect our brain, body, actions, and the physical world. In other words, human beings are complex biophysical machines only, and therefore, our personality and our consciousness return to oblivion when we die.

Materialist ideology became extremely dominant in the academic milieu during the twentieth century. So dominant, in fact, that most scientists started to believe that this ideology was based on empirical evidence and that it represented the only possible rational conception of the world. Scientists also tacitly understood that they could endanger their careers if they dared to question this dogmatic and intolerant ideology.

We must admit that scientific methods based on materialist philosophy have proved highly successful as they have led to a better understanding of nature, as well as greater control and freedom through technological advances. However, the almost absolute dominance of materialism in the academic world has greatly stifled science and hindered the development of the scientific study of the mind, consciousness and spirituality. Faith in this ideology, as an exclusive explanatory framework of reality, has led scientists to neglect the subjective dimension of human experience. Scientific materialism has also brought a severely distorted and impoverished conception of ourselves and of our place in nature.

Science is first and foremost a non-dogmatic and open method of acquiring knowledge about nature. This method is based on observation, experimental investigation and theoretical explanation of phenomena. In this sense, science is not tantamount to materialism and should not be influenced by any belief, dogma or ideology.

The “Dematerialization” of the World

In April 1900, British physicist Sir William Thomson, also known as Lord Kelvin, asserted with confidence, at a conference he gave at the Royal Society of London, that there was practically nothing left to be discovered in physics. Lord Kelvin, however, recognized that two “little clouds” darkened the serene sky of his discipline – the problem of ether and that of blackbody radiation. He also claimed that these minor problems, which were anomalies for classical physics, would soon be solved by refining the existing theories.

Lord Kelvin could not be more mistaken as these two little clouds shook physics to its very core – the ether problem was eventually solved by the theory of relativity while that of blackbody radiation was solved by Max Planck who proposed a bold hypothesis that soon led to the birth of quantum mechanics (QM), a revolutionary branch of physics.

This new physics invalidated the metaphysical postulates underlying scientific materialism by demonstrating that atoms and subatomic particles are not solid objects – they do not exist in definite places and times. Indeed, in the quantum domain, atoms and subatomic particles show "tendencies to exist,"[5] shaping a world of possibilities rather than things or facts. QM has thus "dematerialized" the world by showing that it is not at all composed of small grains of matter comparable to tiny billiard balls.

QM also demonstrated the need to introduce the mind into its basic conceptual structure since it has been discovered that the particles observed and the observer – the physicist and the method used for observation – are related. This is called "the effect of the observer." This phenomenon reveals that the physical world is not the only or primary component of reality, and it cannot be fully understood without referring to the mind. In other words, as Wolfgang Pauli, one of the founders of QM, said, our reality consists of two complementary but distinct aspects: the physical and the psychological, *physis* and *psyche*.

The effect of the observer has led some of the pioneers of QM – for instance, Max Planck, Erwin Schrödinger, John von Neumann and Eugene Wigner – to propose that the consciousness of the observer is vital for the existence of measured physical events, and that mental events can influence the physical world. The results of recent studies support this interpretation (we will come back to this topic later).

Non-locality (or non-separability) is another important discovery in QM. This principle is based on entanglement, which refers to persistent instantaneous connections between particles (e.g., photons or electrons) that interacted together before being separated. Surprisingly, these connections persist even if the particles in question are separated by huge distances (for example, billions of light-years). This counterintuitive aspect of nature, which was described by Albert Einstein as a "spooky action at a distance," has been confirmed experimentally in several laboratories since the 1970s. Non-locality and entanglement suggest that the universe is an indivisible whole. As I will demonstrate in this book, the principle of non-locality does not

seem to be confined to the microphysical domain since it also exists in the world of the *psyche*.

It is a pity that even though QM has invalidated the metaphysical postulates of materialism, some scientists and philosophers, by ignorance or bad faith, still cling to this superstition. Some of them, the "fundamaterialists,"[6] behave like true religious fanatics to defend this erroneous and obsolete system of beliefs.

A Pivotal Event

A few years ago, in collaboration with psychology researchers Gary Schwartz from the University of Arizona and Lisa Miller from Columbia University, I helped organize the International Summit on Postmaterialist Science, Spirituality and Society. The purpose of this meeting, held in Tucson in February 2014, was mainly to analyze the various types of empirical evidence supporting postmaterialist science. There was also a discussion about the evolution and recognition of a postmaterialist paradigm, as well as its potential impact on spirituality and society. Internationally-recognized scientists, from various fields of expertise – including biology, neuroscience, psychology, medicine and parapsychology – took part in this pivotal event.

The conclusions of the summit were published a few months later in the form of a document entitled *Manifesto for a Post-Materialist Science*. This manifesto was published in the scientific journal *Explore: The Journal of Science and Healing*. Since its publication, more than 300 scientists and philosophers from around the world, including some very prestigious ones, have signed this document.[7]

Some have criticized this manifesto by saying that my colleagues and I are non-conformist scientists, and that our point of view does not represent the dominant view. However, as noted in a highly complimentary article about us by Dave Pruett[8] – a former NASA researcher and Emeritus Professor of Mathematics at James Madison University: "We must not forget that neither Copernicus nor Galileo nor Kepler nor Einstein represented the current and dominant scientific position. These great minds questioned the scientific status quo, and we eventually ruled in their favor and accepted their theories."

Our postmaterialist science summit also led to the *Open Science Campaign* and the creation of a website of the same name. The site is a portal

promoting research that goes beyond the dogmas that still significantly influence contemporary science. The main areas of research covered include studies on consciousness, integrative medicine and healing, postmaterialistic scientific approaches, as well as novel aspects of cosmology, physics, chemistry and biology. The website refers to books and provides access to videos, articles and links to sites of researchers and organizations known for their open-mindedness.

More recently, I participated in the writing and editing – in collaboration with Gary Schwartz, Natalie Dyer, a young neuroscientist at Harvard University, and Marjorie Woollacott, another neuroscientist – of an anthology entitled *Expanding Science: Visions of a Postmaterialist Paradigm*.[9] Several researchers, visionary and innovative, from various disciplines (e.g., Amit Goswami, Rupert Sheldrake, Larry Dossey, Pim van Lommel, Gary Schwartz and Dean Radin) as well as a few philosophers contributed to this work. Its main objective is to analyze the empirical evidence challenging the materialist position. This anthology discusses, from multiple stances, the emerging postmaterialist paradigm and its implications, and the broadening conceptual scientific framework. This important work targets nonspecialized readers.

A short time ago, I attended yet another important meeting, also held in Tucson, Arizona. This meeting marked the creation of *the Academy for the Advancement of Postmaterialist Sciences (AAPS)*. One of the goals of this organization is to promote cultural change in connection with our understanding of human experience and reality. To achieve this, the academy encourages scientists, in various ways, to go beyond the limits imposed by an exclusively materialist and reductionist approach to science.[9]

Along the same lines, a few years ago, the Scientific and Medical Network (SMN, www.scimednet.org) – a worldwide professional community and membership organization for open-minded, rigorous and evidence-based enquiry into themes bridging science, spirituality and consciousness – created the Galileo Commission. The main goal of this project is to find ways to expand science so that it can explore and accommodate important questions and human experiences that mainstream science is unable to integrate. Following widespread consultation with 90 advisers representing 30 universities worldwide, the SMN published the Galileo Commission Report, a groundbreaking document (entitled *Beyond a Materialist Worldview: Towards an Expanded Science*) written by Professor Dr. Harald Walach, a

researcher at the interface between medicine, psychology and consciousness studies.

The Reasons behind This Book

Even though QM appeared almost a century ago, most people – and even scientists who are not physicists – unfortunately remain unfamiliar with its fascinating and profound implications. They are therefore unaware that this branch of physics demonstrates that the metaphysical postulates of scientific materialism are not valid. Therefore, a significant part of society remains under the influence of a mechanist, materialist and reductionist view of the world. For example, different spheres of human activity – like politics, economics, education, health and the media – are still guided in part by this outdated concept which we need to get rid of.

This is a propitious situation for some materialists who are also militant atheists, such as scientists Richard Dawkins, Lawrence Krauss, Richard C. Lewontin and Paul Zachary Myers, as well as philosophers Daniel Dennett, Patricia Churchland and André Comte-Sponville. These advocates of rationalism are actively involved in a cultural war against religion and claim to represent ultimate cognitive authority. They maintain the naive and presumptuous belief that neuroscience will eventually be able to completely reduce the mind and consciousness to what is happening in the brain. What should be noted about this is that this prophetic belief, which philosopher of science, Karl Popper, called "*promissory* materialism," had already been professed by proponents of atheistic materialism during the eighteenth century.

Materialist theories miserably fail to explain how the brain could produce mental functions and consciousness. These theories are also unable to explain what the philosopher David Chalmers calls "the hard problem of consciousness": why and how the experiential aspects of our mental lives (which philosophers call the *qualia*), which we access by introspection, result from the activity of a group of neurons in the brain? Why do certain physical states of the brain cause lavender to look purple or for it to be painful to be stung by a wasp?

To better understand the mind-brain relationships, we must leave the suffocating and limiting framework of scientific materialism and consider all research on consciousness. These highlight a whole array of empirical

evidence which, like discoveries in QM, are totally incompatible with the old materialist paradigm.

This empirical evidence is meticulously analyzed in this book. This includes the mental ability to influence brain activity, psychosomatic network and genes; psi phenomena such as telepathy, distance vision, precognition, mental influence on physical systems and living organisms; phenomena associated with death such as near-death experiences, shared death experiences, and deathbed visions; reincarnation; and transcendent experiences. In the last section of this book, I present my view of the main elements that make up the postmaterialist paradigm. Many of my colleagues and I are convinced that this paradigm will lead us to the next great scientific revolution. The implications of this new paradigm are therefore tremendous, both for everyday life on an individual level and for the future evolution of our species.

May this book transform your life by finally liberating you from the materialist straitjacket.

Chapter 1

Thoughts that Transform the Body

Your worst enemy cannot harm you as much as your own thoughts, unguarded. But once mastered, no one can help you as much.
The Buddha

A Few Fundamental Dogmas in Neuroscience

Every human being – religious, scientist or atheist – needs to believe in something. In the case of atheists, they believe in "nothingness" after death, even though they hold no evidence of it. They also believe that God – or a transcendent principle at the origin of the world – does not exist. With respect to scientists and Science, and with science being a product of human activity, it is not immune to prejudices and dogmatic beliefs. This is particularly obvious when most scientists who work in a specific area of research embrace a dogma extensively. The impenetrable truth status attached to Darwinism in biology proves the impact that such a phenomenon can have.

For more than a century, neuroscience researchers have believed that new neurons could not develop in the adult human brain – we were born with a maximum number of neurons, and this would only dwindle throughout our life. Neuroscientists also believed that the adult brain was a static machine that did not have the ability to change. However, in recent decades, this dogma has been cast aside in light of several studies that have convincingly shown that parts of the human brain, as well as many animal species, retain the ability to produce new neurons throughout adult life. According to these studies, contrary to what we thought, the adult human brain is very plastic. Indeed, it constantly alters its structure and function by creating new neurons and synaptic connections between neurons. In addition, in the mature brain, existing neural networks are constantly reorganized, and new networks are developed. This neuroplasticity indicates that we are not prisoners of the

brain we inherited at birth.

As mentioned in the introduction, another fundamental dogma in neuroscience, one that remains influential, is the idea that all mental events, consciousness and the self are simply reducible to the physical and biological processes of the brain. In this regard, different materialist theories have tried to explain how the brain produces the mind. One of them is the theory of psychophysical identity. This theory claims that we comprehend our mental processes and our consciousness in the first person, that is, from within and subjectively ("I feel happy."); while with neuroscience techniques, our brain activity is measured in the third person, that is externally and objectively ("My brain releases more serotonin when I am happy."). In other words, mental events and brain events are perfectly parallel, like two sides of the same coin. However, it is brain states, electrical impulses, and chemical reactions in our brain that create mental states, not the other way around. Most contemporary neuroscientists stand by this view, including Gerald Edelman and Jean-Pierre Changeux.

Eliminativism is another prominent materialist theory about the relationship between mind and brain. The philosophers Paul and Patricia Churchland, as well as Daniel Dennett, are illustrious supporters of this radical theory that denies the existence of mental events: our mental world is just an illusion, and we are only imagining having sensations, memories, emotions and thoughts. Eliminativism recognizes only the biophysical processes of the brain. It posits that "mind," "consciousness," "ego," and "free will" are prescientific concepts that stem from naive and simplistic ideas belonging to "popular psychology." Proponents of this theory hope that these concepts will soon be eradicated thanks to advances in neuroscience. As to *qualia* – how things appear to us individually, Daniel Dennett vehemently claims that these experiential aspects of our mental lives are also mere illusions.

Those who support materialist theories often incorrectly claim that methods in neuroscience – like, for example, brain imaging techniques – measure mental events. This cannot be more wrong because these events are not physical. Indeed, a thought has no shape, no mass, and no volume. Materialists also often claim that studies using these methods demonstrate that the brain generates both mind and consciousness. They believe that the fact that mental functions are affected when the brain is damaged strongly supports this concept.

This conclusion is inaccurate because neuroscience methods only allow us to measure correlations – that is, reciprocal relations – between cerebral states and mental events. Hence, when the state of the brain changes, mental activity also changes; and when mental activity changes, the state of the brain also changes. However, the correlations between mental activity and brain activity do not imply causality and identity. For example, researchers can record the electrical activity of the brain using electroencephalography (or EEG). Electrodes are applied to the scalp of subjects while they experience a feeling induced by emotionally charged images. However, the brainwaves recorded by the EEG are completely different from the emotions that are experienced by the subjects. Moreover, the correlation between the electrical activity of the brain and the variation of the emotional state of the subject does not mean that the changes in the EEG are the cause of the changes reported in the emotional state.

The flawed belief about the identity of mental events and their neural correlates leads to what has been called the "mereological fallacy": the erroneous attribution of mental properties to parts of the brain or to the brain itself.[10] The materialists who commit this error elevate the brain to the level of an omnipotent physical entity, whose properties make it possible to explain all mental phenomena. These materialists do not seem to realize that it is the person – not their brain – who is conscious, who thinks, who decides and who believes.

The Compelling Placebo Effect

David Kallmes is an affiliated neuroradiologist at the renowned Mayo Clinic, whose headquarters are in Rochester, Minnesota. During the last two decades, Kallmes has performed many vertebroplasties. Conducted under continuous radiographic control, this surgical technique allows for the restoration of a vertebral fracture by injecting a type of bone "cement." The cement is completely hard after a few hours, and twelve hours later, the patient can stand up.

Vertebroplasty produces impressive results even when the wrong vertebra is accidentally filled with cement. This peculiarity intrigued David Kallmes. Suspecting that other factors were responsible for the effectiveness of this medical procedure, he decided to conduct a study to determine if vertebroplasty was more effective than a placebo – a treatment that has no biological action but can be effective when the person receiving the placebo

thinks they are receiving active treatment.[11]

Doctors are aware that the beliefs and expectations of their patients, when it comes to treatments, may affect the results of these treatments. In clinical trials, medical researchers consider the placebo effect a nuisance since this phenomenon prevents the conclusion of whether the new experimental treatments are effective. To circumvent this problem, participants in clinical trials are randomly assigned to either the group receiving the true (active) treatment, or to the one receiving the fake treatment (placebo, for example, a sugar pill). Neither researchers nor participants have access to this information before the end of the tests. This is called the double-blind randomized clinical trial protocol, with a control for the placebo effect. When the clinical trial is complete, researchers subtract the placebo effect from the real treatment.

In this particular case, Dr. Kallmes and his colleagues developed a clinical trial in which some patients would receive true vertebroplasty while other patients would receive placebo surgery. To ensure that the 130 participating patients at the clinical trial could not know if they received the active treatment or the false treatment, they were prepared for their "operation" in the same way: they were brought into the operating room and then they were injected with an anesthetic agent in the back. Then a computer program randomly decided which patients would receive vertebroplasty or placebo. For both types of procedure, the doctors opened the container containing the bone cement, which gives off a strong smell akin to nail varnish solvent.

Half of the patients received vertebroplasty, while the other half received the fake surgery. For the placebo patients, the doctors adhered to the following scenario: they pressed the patients' backs and told them: "The cement is entering now, everything is fine, a few more minutes and everything will be over."[11]

Bonnie Anderson was one of the patients recruited for this clinical trial. She had a broken vertebra after a fall in her kitchen. Bonnie could hardly move due to the acute pain, and she could only walk by holding on to things. However, one week after the surgery, this 76-year-old woman could play golf again. What is remarkable in her case is that Bonnie received the fake surgery. The placebo procedure was also effective for several other patients who participated in this clinical trial. So effective that there was no statistically significant difference in terms of decreased pain relief and

functional improvement between patients in both groups.

The research results indicate that the placebo effect is involved in all types of medical and psychological treatments. Thus, the meta-analyses – which are statistical analyses combining the results of several studies to more accurately assess the true magnitude of the phenomenon being studied (or "effect size") – indicate that the placebo effect plays a crucial role in clinical trials for drugs targeting mood disorders such as major depression. In this regard, clinical researchers and psychologists Irving Kirsch and Guy Sapirstein examined the results of more than 19 clinical trials involving more than 2,000 patients. These researchers found that 75% of therapeutic outcomes are attributable to the placebo effect.[12]

Research on the placebo effect also reveals that the more we believe in a given treatment and trust a therapist – it does not matter if it's a Western medicine doctor, a homeopath or a shaman – the more likely it is that the treatment will be effective and mobilize our powerful innate mechanisms of self-healing. Hope, positive emotions, motivation, anticipation of improvement, and a warm and thoughtful attitude on the part of the therapist also contribute to induce a strong placebo response.

Administering a placebo does not always trigger the desired self-healing mechanisms. It can sometimes lead to unwanted and unpleasant symptoms such as drowsiness, nausea, fatigue and insomnia. This phenomenon is called the nocebo effect and represents the dark side of the placebo effect. It can occur when our expectations of a treatment are negative rather than positive. If the administration of a treatment is accompanied by warnings related to potential side effects, these negative effects are more likely to occur. In the book *Love, Medicine and Miracles*, Dr. Bernie Siegel, a now retired pediatric surgeon, cites a study that aimed at testing a new chemotherapy drug. Patients randomly assigned to the placebo group were informed that they could receive this new drug, and that it could have negative side effects. Even though these patients received only one saline injection, 30% of them lost their hair.[13]

The nocebo effect is also observed with real drugs. For example, in a clinical trial, finasteride was given to men suffering from prostate enlargement. Half of the participants in this clinical trial were warned that this drug could produce erectile dysfunction, while the other half of the participants were not informed of this potential side effect. In the informed group, 44% of participants reported that they were experiencing erectile

dysfunction, while this side effect was reported by only 15% of participants in the uninformed group.[14]

The nocebo response is not unique to clinical trials. Thus, after the sarin gas attack on the Tokyo subway in 1995, hospitals in this Japanese megalopolis were overwhelmed by cases of individuals who believed they had been exposed to this deadly neurotoxic substance. These individuals had symptoms that had been highly publicized, such as nausea and dizziness. It turned out that these individuals had not really been exposed to sarin. This type of reaction is common when the agent is not visible, such as radiation and some chemicals.[15]

The different types of placebo reactions are associated with various changes in brain activity. This phenomenon is well illustrated by the cerebral response of patients suffering from Parkinson's disease, a degenerative neurological disorder characterized by tremors, slowing of mobility and muscle rigidity. In this neurological disease, there is a marked decline in the amount of dopamine, a chemical messenger, found in basal ganglia (also called basal nuclei). In a positron emission tomography (PET) scanner, researchers scanned the brains of Parkinson's patients to compare brain responses to apomorphine – a drug that activates dopamine – and salt water – a placebo treatment. Both treatments were administered following a double-blind protocol. Placebo treatment was presented as stimulating mobility. Compared to those who received no treatment, placebo patients showed a dramatic increase in dopaminergic activity in the basal ganglia. This increase was comparable to that observed with the therapeutic dose of apomorphine given to other patients.[16]

The nocebo response is also accompanied by significant changes in brain activity. For obvious ethical reasons, very few neuroimaging studies have been conducted to examine the brain's response to negative expectations. The few studies that have been conducted in this regard focus on pain. These studies reveal that negative expectations lead to an amplification of pain – the more the degree of anticipated pain increases, the more the brain regions involved in the perception of pain become activated. Conversely, expectations of decreased pain reduce the activation of brain regions related to the treatment of pain information.[17]

Managing Emotions

Emotions are physiological changes in terms of heart rate, blood pressure,

muscle tension, skin temperature, etc. in response to events occurring either in the external environment (for example, seeing a wild animal close to us in a split second while strolling in the forest), or in the internal environment, that of the *psyche* (for example, the recollection of a memory that is dear to us). These multidimensional responses also involve a cognitive analysis of what is happening in the environment (internal or external), behavioral expressions (for example, defending oneself in response to a threat) as well as changes in subjective experience – that aspect of emotions called feeling (for example, being scared).

Our emotions play a crucial role in our life – they help us make choices about the people, events and situations we encounter during our lifetime. However, when our emotions are repeatedly negative, multiple problems and enormous suffering may ensue.

The physiological aspects of emotions are closely related to brain regions that are part of what is commonly called the emotional brain (in neuroscience jargon: the limbic system). These areas are ancient, from a phylogenetic point of view, and are found in all mammals.

Luckily, most members of our species can learn to control their emotions. Otherwise, the innermost impulses in our archaic emotional brain would completely overwhelm us. This vital capacity for the future of humanity is mediated by some subdivisions belonging to the prefrontal lobe, the most recent brain structure in terms of our biological evolution. Compared to other mammals, the prefrontal lobe is much more developed and bulkier within our species. This structure, sometimes called the “Organ of civilization,” is considered as the key region for implementing the rational aspect of the mind.

There are important anatomical connections between the various regions of the prefrontal lobe and those that are part of the emotional brain. Connections from the prefrontal lobe to the emotional brain transmit inhibitory information, which allows voluntary control of emotions and feelings that accompany the activity of limbic structures. This capacity is one of the main components of emotional intelligence.[18]

At the beginning of the new millennium, I was the first neuroscientist to undertake a research program aimed at studying what goes on in the brain when healthy individuals try to voluntarily take control of their emotions. In the initial study of this research program, my colleagues and I asked young men to watch clips from erotic films. Participants were scanned with

functional magnetic resonance imaging (fMRI) – a method to measure changes in blood oxygenation connected to neuronal activity – during a control condition and an experimental condition. In the control condition, participants only watched movie clips and had to react normally. In the experimental condition, the participants had to cognitively distance themselves – they had to watch other extracts of similar films in a dispassionate way, without trying to evaluate or judge them. A questionnaire was used to measure the intensity of the emotional responses in both conditions. This questionnaire revealed that all the participants had been sexually excited by the clips of erotic films. Unsurprisingly, in the control condition, sexual arousal was correlated with the activation of various brain structures that are part of the emotional brain (for example, the amygdala and the hypothalamus). What is remarkable in this study is that even if the participants had been trained in cognitive distancing only for a few minutes before the start of the experiment, they were all able to subjectively reduce their excitation during the experimental condition. Moreover, no activation was detected in regions belonging to the emotional brain. As per the notion that the prefrontal lobe acts as a regulating center of emotions, an activation was recorded in some subdivisions of this brain structure.[18]

In the second stage of our research program, we conducted another fMRI study using a similar approach.[19] In this second study, we measured the brain activity of young women trying to master a temporary response of sadness, which was also evoked by film clips. These showed the death of a loved one. The results were similar to those of the first study. The activity decreased significantly in the emotional brain during the experimental condition, while there was increased activity in some areas of the prefrontal lobe.

These results show that an adult in good mental health is not just a simple biological machine that only reacts to various stimulations. In fact, this person is neurobiologically equipped to be able to control her reactions and those of her brain in the face of emotionally charged events. It is important to point out here that even if the neurobiological equipment in question is in the prefrontal lobe, this crucial structure of the brain must be directed consciously and voluntarily by the person.

As part of this research program, I sought to determine whether mentally and neurobiologically healthy individuals are also able to influence the activity of chemical messengers that play a significant role in emotional life. My colleagues and I used PET to evaluate serotonin production during rapid

and sustained changes in an emotional state.[20] This chemical messenger is known for its central role in controlling emotions and mood fluctuations.

We asked participants in this study to experience temporary states of joy and sadness through self-induction. We suggested that they relive intense emotions associated with specific autobiographical memories. All participants indicated that they had experienced both emotions. The PET results reflected these subjective perceptions since the level of sadness felt was correlated with a reduction in serotonin production in the emotional regions of the brain; while conversely, the level of joy felt was correlated with an increase in serotonin production in areas of the emotional brain. These results are consistent with studies demonstrating a reduction in serotonergic activity in these areas in individuals with major depression.

Brain Transformation through Meditation

Meditation refers to a wide range of mental training techniques that have been developed to promote cognitive abilities, emotional balance and well-being. During the last decade, several studies have indicated that intentional directing of attention through meditative practices can lead to significant plastic changes in the brain. These practices are generally classified into two categories: concentration and mindfulness.[21]

Concentration practices involve focused attention on certain specific body sensations (breathing, for instance) and aspects of mental activity (for example, a mental visual image or a repeated sound).

As for mindfulness practices, they entail letting all thoughts, emotions and sensations emerge from moment to moment, while maintaining, without judging nor analyzing, an attentive yet detached consciousness. These two meditative technique categories slow the internal mind monologue down – a deeply soothing feeling of serenity as well as an expanded self-experience which is no longer centered on the thoughts of the meditator and representations of her body.

The “mindfulness-based stress reduction” method (MBSR) is an eight-week group program based on the practice of mindfulness meditation. Thousands of people have participated in this program, and studies have shown its effectiveness in reducing stress, anxiety and depression, and increasing well-being, compassion and spirituality.[22]

Research with the EEG reveals an increase in alpha and theta activity during mindfulness meditation practices, such as Zen and Vipassana. Alpha

waves (8 to 12 Hz [cycles per second]) are generally associated with relaxation, whereas theta waves (from 4 to 8 Hz) are more specifically associated with meditative states. It seems that the extent of the increase of theta waves during meditative states reflects the level of expertise of the meditators.[23] Other EEG studies indicate that the increase in beta 2 activity (from 20 to 30 Hz) and gamma activity (from 40 to 100 Hz) is a characteristic of concentrative meditation states. Beta 2 activity is often observed in tasks involving focus of attention. Gamma activity is believed to be related to the content of our mental experiences and to our consciousness.[24] Gamma waves were recorded in experienced Buddhist Tibetan monks while they were engaged in a form of meditation called "non-referential compassion."[25] In this type of meditative state, meditators focus on boundless compassion and loving kindness for all living beings. Stunning increases in gamma waves were measured during the non-referential state of compassion in relation to a resting state. The more the monks have trained in this form of meditation, the higher and longer their gamma activity is. On the other hand, this high gamma activity lingers among monks even though they have stopped meditating. These results suggest that even outside a meditative state, meditation training can have long-term changes on brain activity.[26]

All EEG meditation studies carried out so far support the idea that different neuroelectric signatures are associated with various types of meditative practices. This is not surprising considering that these practices differ in their subjective experiences and mental processes.

FMRI has also been used in several studies to identify neuroplastic changes induced by the practice of meditative techniques. Some of these studies were conducted by my research team. In one of them, we examined the effects of mindfulness meditation on brain responses to emotional images.[27] In this study, we also analyzed the impact of the duration of the training in mindfulness meditation on emotional brain responses to such images. Experienced meditators, followers of Zen meditation, were compared with novice meditators. These novice meditators practiced mindfulness meditation for 20 minutes a day during the week before the experiment. Both groups of participants were scanned while viewing the images in a state of mindfulness or in a state without mindfulness. From the experiential point of view, the participants in both groups perceived the images seen in a state of mindfulness as less intense than those seen in a state without mindfulness. Moreover, in the experienced meditators, mindfulness was accompanied by

reduced activity in emotional brain areas. These results suggest that training in mindfulness meditation leads to a reduction in brain activity, accompanied by a calming down of the mental state.

Other fMRI studies have shown that the practice of meditation leads to changes in the functioning of the brain regions involved in attention and concentration, as well as empathy.

It is now well established that the structure of an adult brain can change following repeated practice. For example, there is an increase in the thickness of the areas associated with music in the brain of musicians, and visual and motor areas in the brain of jugglers. In this context, some researchers have wondered whether the practice of meditation can also lead to structural changes in the brain. These researchers used a technique called anatomical MRI to tackle this question. The studies revealed that the training in mindfulness meditation leads to an increase in the density of grey matter – which contains the cell bodies of neurons – in areas of the brain involved in learning and memory, empathy and emotion management.[28] The practice of meditation can also change the white matter, which is responsible for communication between different regions of the brain, in brain areas which are important for attention and the management of emotions.[29]

Impact on our Psychosomatic Network

Immunology researchers have long argued that the immune system and the nervous system are separate. However, about 30 years ago, research indicated that the immune system is not really an "isolated" defense system because chemical messengers produced by immune cells inform the brain, and the brain also sends messages to the immune system. Since then, it has also been discovered that the nervous system and the immune system interact with the endocrine system. These discoveries led to the emergence of psychoneuroimmunology (PNI), the study of interactions between mental processes and these three physiological systems. All these together make up the "psychosomatic network," and communicate with each other bi-directionally, through a common biochemical language that involves the sharing of receptors as well as neurotransmitters, cytokines (molecules produced by the cells of the immune system) and hormones. These act as "informational substances."[30] It is *via* this vast multidirectional network that our thoughts, emotions and subjective experiences are chemically translated, and that they influence our health and well-being. PNI studies indicate that it

is through the interaction between psychological factors and biochemical changes affecting the psychosomatic network that the causes, development, and outcomes of a disease are determined.

Let's consider stress for a moment. When we stress, our adrenal glands secrete cortisol, and our brain releases chemical messengers such as adrenaline and norepinephrine. A little stress can help us mobilize all our resources to achieve our goals. However, too much stress can perniciously affect immunity. For example, acute or chronic stress can increase the duration and severity of infectious diseases, reactivate latent viruses, and prolong wound healing. This is well illustrated by the fact that when medical students receive a hepatitis B vaccine, during a very stressful final exam period, they do not develop complete protection against this life-threatening viral infection.[31] Situations and events that are perceived as uncontrollable, such as unemployment and natural disasters, can also weaken immune responses.[32] In addition, chronic negative emotional states, such as those noted in major depression, are associated with increased mortality.[33] Increased risk of death and decreased immunity are also observed in bereaved spouses during the first years after the death of their partner.[34]

Unlike negative emotions, positive emotional states can significantly improve health. In another PNI study, researchers administered the influenza virus to participants who were then placed in quarantine, and the reactions to the virus were analyzed according to the emotional state of the participants. The results showed that participants whose emotional state was positive had a reduced risk of developing influenza.[35] A positive emotional state is also associated with a decrease in mortality.[36]

Most of the time, we influence our psychosomatic network and our health unconsciously and involuntarily. However, some research suggests that it is also possible to have a conscious and deliberate influence on the activity of our psychosomatic network. In this regard, several studies indicate that in cancer patients, relaxation and mental imagery – the ability to form mental images of objects or events that are not in the sensory field – reduces anxiety and depression, reduces nausea and vomiting caused by chemotherapy, and increases the activity of the immune system and the quality of life.[37]

David Seidler's story reveals how mental imagery can sometimes be effective in fighting serious diseases. This Anglo-American playwright and screenwriter is best known for *The King's Speech* screenplay, for which he won the 2011 Academy Award for Best Original Screenplay. In 2005, at

almost 70, Seidler learned he had bladder cancer. After seeing his urologist, Dr. Dino DeConcini, Seidler decided against chemotherapy or having his bladder removed. Instead, he took supplements to boost his immune system. He also opted for the surgical removal of the cancerous tumors in his bladder.

A few months later, David Seidler learned that his cancer was back. He made an appointment with Dr. DeConcini to have the cancerous tumors removed once more. This appointment was set for a few weeks later. His wife at the time suggested that he try to visualize his cancer disappearing. At first, Seidler thought this suggestion was the most ridiculous thing he had ever heard. However, after further contemplation, Seidler decided he had nothing to lose.

For two weeks, he visualized a bladder in perfect condition for hours. Then he went to meet Dr. DeConcini for his second surgery. The urologist was astounded to find that Seidler's cancer had completely vanished. This cancer has never come back since. David Seidler is convinced that he survived his bladder cancer because he did not give in to self-pity, and instead, used the same vivid imagination he did to write movie scripts.[38]

We are Epigenetic Engineers

There is growing evidence that the mind can also influence genes. With this in mind, I think it would now be relevant to include genes in our representation of the psychosomatic network.

During the twentieth century, several influential biologists have defended genetic determinism – the idea that physiological processes of the body – as well as personality traits, mental abilities and behaviors – are largely controlled by genes. This implies that since we cannot change our genes, our life is predetermined. In other words, we are victims of our inheritance and we have little influence over our health.[39] In the media, this old belief is still propagated by some science journalists who portray genes as powerful entities that have the power to define personal identity, determine the course of human affairs and explain social problems.[40]

Fortunately, Epigenetics has shattered this erroneous belief. This relatively new scientific discipline studies environmental signals that modulate gene expression and activity. Genes are either active or inactive.[41] Signals that modulate gene expression arise from the internal environment (mental events, e.g., thoughts and emotions) or the external environment (e.g., diet, exercise and exposure to sunlight).

The discoveries in epigenetics reveal that our genetic makeup does not control us. Our thoughts, emotions, and beliefs are constantly actively influencing the expression of our genes. How is this possible? Biologist Bruce Lipton suggests that it is the biochemistry of our body that determines the nature of our environment at the cellular level. We know that the biochemistry of our blood is greatly influenced by the chemical messengers that are produced in the brain, and that our brain chemistry is directly related to the content of our mental activity. Lipton claims that our thoughts, emotions, and beliefs can thus affect the activity of our genes.[42] Hence, we can all be considered as "epigenetic engineers."

It seems that we possess the crucial ability to influence the expression of our genes. For example, we can consciously choose to generate comforting thoughts, maintain emancipating beliefs, and experience positive emotions. In order to achieve these goals, we can learn to meditate. In this regard, some studies show that when we meditate, our genes express themselves in a way that is beneficial to our health. One of these studies was led by Herbert Benson, an American cardiologist who founded the Institute for Mind/Body Medicine at Massachusetts General Hospital in Boston. Benson and his colleagues compared the gene expression of healthy men and women (control group members) with that of experts in mind-body practices. On average, expert participants had practiced yoga or meditation for nine years. A blood sample was collected from all participants in the study, and the genetic material was extracted from the blood. This material was then analyzed to determine the differences between the two groups of participants in terms of gene activity. In total, the researchers found that 2,209 genes were expressed differently in both groups. These genes – which play an important role in stress, inflammation and aging – are also known to be associated with good health. This means that the same genes, which have a beneficial effect on health if we practice a mind-body technique, can have a harmful effect on our health if we do not practice such a technique.[43]

Benson and his colleagues performed another study to determine if gene expression in the control group could be transformed by a mind-body approach. These participants followed an eight-week program involving relaxation, visualization and deep abdominal breathing. At the end of the program, a new blood sample was collected from the control group to assess how gene expression had changed in these participants. What the researchers discovered is remarkable: 1,561 genes had changed their expression and 433

genetic “signatures” were now comparable to those found in mind-body experts.[44]

Other epigenetic studies reveal that positive emotions increase the expression of the associated genes to the activity of NK cells (natural killers) that play a key role in the immune system. Moreover, it has recently been shown that three months of intensive meditation practice causes a 30% increase in telomerase, an enzyme that repairs and stretches telomeres, which are the DNA sequences at the end of chromosomes. These telomeres play an important role in cell division, and their length is an indication of cell longevity. This discovery suggests that meditation could slow the aging of our cells.[45]

Chapter 2

Perceptions Beyond Space and Time

The greatest mystery of science is the nature of consciousness.
Nick Herbert

Remote Viewing

During the mid-1970s, right in the middle of the Cold War, the US military hierarchy tried to find ways to compete with the USSR. The military, together with government agencies like the Central Intelligence Agency (CIA) and the Defense Intelligence Agency (DIA), decided to create the Stargate Project. The goal of this top-secret project was to verify if "remote viewing" – a form of extrasensory perception (ESP) allowing a viewer (also called a "perceiver") to give details about a distant target in space (a place, a thing or a person) inaccessible to the normal senses – was an effective way to obtain sensitive information. The 20-year Stargate Project was subsidized to the tune of $20 million. Many of the experiments in this project were conducted at the Stanford Research Institute (SRI) under the supervision of physicists Russell Targ and Harold Puthoff.

One type of remote viewing experience that was developed at SRI is to send a "sender" to an unknown location and then ask the remote viewer to describe that location. The description is done verbally or through a drawing: the information generally collected consists of an impression of knowledge as well as sensory impressions (images, sounds, smells). The extent to which the descriptions correspond to the place is then evaluated by a group of judges. It is considered successful when the viewer's description matches the sender's location. In another type of protocol, the senders remain still: they only choose an image from a *National Geographic* photography bank.[46]

Over time, the protocols tested by the SRI research team were refined and conducted in a double-blind manner – neither the experimenters nor the

participants knew the target.

The Stargate Project has provided information related to strategic enemy sites or weapons, political leaders, terrorist groups or drug trafficking operations. One of the star viewers of this research program was the late New York painter Ingo Swann, who trained the viewers at the CIA and intelligence services of the US Defense for 10 years. Swann also helped physicists Targ and Puthoff to design the initial remote vision protocol. During one session, he precisely described a ring around Jupiter. Scientists were unaware of this ring, which was confirmed years later when the Pioneer 10 Space Probe flew over this planet.

Researcher, author and documentary producer Stephan Schwartz is another pioneer of remote viewing. He is famous for his use of this mental capacity in the location and reconstruction of archaeological sites. Schwartz has been part of several intuitive archeology expeditions, especially on the shores of Grand Bahama where he found the Brig Leander, and on St. Ann's Bay in Jamaica where the caravel of Christopher Columbus was discovered. From 1978 to 1979, he directed the Alexandria Project whose objective was to measure the effectiveness and relevance of using remote viewing as a tool to assist archaeological exploration. Four targets were selected: the ancient city of Marea, the tomb of Alexander the Great, the Great Library and a site known in Antiquity as "the Hill of Numerous Passages."

The first phase of the project began in the United States in the summer of 1978. Eleven viewers were chosen to participate in the project. A questionnaire was sent to them, as well as a standard card where colors and names had been removed to avoid any visual disturbance. All data was sent to a bailiff in Los Angeles for analysis. Based on all the answers of the 11 viewers, it was possible to define three important research areas: one near the Nabi Daniel Mosque, another far east next to a kind of park, and the last on the main peninsula separating the western port from the eastern port.

The second phase of the project could now be launched. In March 1979, Stephan Schwartz and some members of his team, as well as two of the members of the original team, Hella Hamid and Georges McMullen, headed for Alexandria. With the help of the two viewers, the chosen areas were explored based on the data collected in the United States. The results were spectacular because the intuitive data made it possible to locate and describe several sites. These results include the discoveries of the palace of Mark Antony, the Ptolemaic palace of Cleopatra, the ruins of the lighthouse and the

city of Marea. Moreover, the data from the viewers paved the way for the first modern cartography of the eastern port. According to Schwartz, the importance of the data obtained intuitively lies in the speed of the verification; divers can simply descend in the zones indicated in order to observe directly.[47]

Coming back to the Stargate Project, hundreds of experiments on remote viewing were conducted at SRI. When this research program was completed, the CIA asked for a report. This report aimed at determining whether the results of these experiments supported the idea that remote viewing can be useful in the collection of sensitive information. Jessica Utts, Statistics Professor at the University of California, Irvine, and Ray Hyman, Professor Emeritus of Psychology at the University of Oregon and notorious skeptic, were entrusted with the task of evaluating this research program. The conclusion of the report was mixed: while Utts stated categorically that proof of remote viewing was well established, unsurprisingly, Hyman declared that he did not agree with this conclusion. However, he acknowledged that the results of the Stargate experiments were not due to statistical errors or methodological problems.[48]

Other researchers have replicated the results of this program under strictly controlled conditions. For instance, Robert Jahn, Brenda Dunne, and their colleagues from the Princeton Engineering Anomalies Research (PEAR) Laboratory at Princeton University conducted 653 trials between 1976 and 1999, involving 72 participants. Several of these tests were conducted in a precognitive way – the future target was randomly chosen once the viewer had recorded their impressions. Statistical analysis of these 653 tests revealed that the probability of the results of these tests being due to chance was one in 33 million.[49]

Mental Connections Beyond Space

Joseph Banks Rhine was a botanist who had also studied psychology. Interested in extrasensory perception (ESP – the term was coined by him) – which includes telepathy, clairvoyance, clairaudience and precognition – he decided in the 1930s to develop a statistical approach in order to study it scientifically. He collaborated with colleague, Karl Zener, at Duke University who was then Director of the Department of Psychology. Together, they created what would be called Zener cards, which include five types of symbols: a star, three undulating lines, a plus sign, a circle and a square. In

total, the Zener card pack contains 25 cards, and consists of a repetition of five cards per symbol. In a purely random way, participants in Rhine's experiments have a one in five (or 20%) chance of guessing which symbols are selected. Results greater than 20% are considered to suggest the existence of ESP.

For decades, Rhine and his colleagues have used these cards to test various aspects of ESP. Hundreds of experiments involving thousands of trials were conducted. In one category of these experiments, to study telepathy, the pack of cards is carefully mixed. Then, one of the two participants, the sender, chooses a card and tries to mentally transmit the symbol appearing on the card to another participant, the receiver, which is at a distance. The perceiver must then correctly identify the mental "information" transmitted by the sender. The results obtained in these hundreds of experiments clearly point to the existence of the various categories of ESP.

While working with Zener cards, Rhine discovered that participants' psi performance weakens when experiments are repeated multiple times. This is hardly surprising since trying to guess for hundreds or even thousands of tests, whose symbols have been chosen, is extremely monotonous. Therefore, after Rhine, parapsychology researchers set out to design new experimental protocols to overcome this problem.[50]

In the 1970s, psychologist William Braud of the University of Houston, parapsychologist Charles Honorton of the Maimonides Medical Center in New York and psychologist Adrian Parker of the University of Edinburgh separately speculated that a weakening in sensory stimulation should promote the occurrence of ESP. This hypothesis was based on the observation that the reduction of mental "noise" – the constant and involuntary chatter of the mind – is associated with a greater manifestation of psi phenomena. This observation has as its origin the Vedas, the religious texts of ancient India. Braud, Honorton, and Parker posited that psi is a weak signal that is usually concealed by more intense signals from our ordinary senses that are constantly inundating us. Independently of each other, these researchers developed a telepathy test based on a sensory deprivation technique called the "Ganzfeld Experiment." This technique, which was initially developed to study visual mental imagery, quickly leads to a pleasant state of consciousness resembling reverie. According to the three researchers, blocking ordinary sensory stimulation *via* the Ganzfeld method should

increase the ability to perceive subtle impressions.[51]

Experiments designed to test telepathy, and based on this procedure, are carried out in three phases: preparing, sending and judging. During the preparation phase, the receiver sits in a comfortable reclining chair in the Ganzfeld room. He has headphones on his ears and translucent half-spheres (usually ping-pong balls cut in half) on his eyes. He listens to a steady white noise through the headphones as a red light is diffused across his face. Then, the experimenter asks a research assistant to randomly select a "batch of targets" from a database that has multiple batches. Each batch contains four images, and all images are hidden in opaque envelopes.

During the sending phase, the experimenter gives the sender the target image. The sender must then attempt to mentally send the image to the receiver, who is in another room. To do this, it is recommended that senders "immerse themselves" in the target image and transmit everything that this image subjectively evokes. Finally, during the judgment phase, the sender and the receiver are informed that the sending phase is over. The white noise and the red lamp are turned off, and the ping-pong half-balls covering the receiver's eyes are removed. Then, the experimenter presents the receiver with copies of the four images that are part of the selected batch and asks him to rank them from 1 to 4 according to how it matches his subjective impressions felt during the sending phase. A "success" is achieved only if the receiver assigns the first place to the target, otherwise the test is considered a "failure." Statistically, the expected success rate is 25%, that is, with random responses, success should be achieved after every four trials.

At the beginning of the 1980s, Charles Honorton refined the methodological quality of Ganzfeld experiments by developing a fully automated protocol called "Autoganzfeld." In this procedure, the targets are composed of short audio-video clips. The batch with the decoys and the target clip is randomly selected by a computer program, and a closed-circuit video system presents the target to the receiver on a screen. On the other hand, the interactions between the experimenter, the receiver and the sender are fully automated, and at the end of the experiment, a computer randomly presents the target and the three decoys on a screen in the receiver room.[52]

The Autoganzfeld Program of Honorton and his colleagues lasted several years. A total of 240 people participated in 354 sessions as receivers, and the success rate was 37%. The probability of these results being due to chance was one in 45,000.[53] Following Charles Honorton's work, independent

replication studies were successfully conducted by a number of researchers, including Adrian Parker (now at the University of Gothenburg in Sweden), Dick Bierman (University of Amsterdam), Daryl Bem (Cornell University) and Dean Radin (Institute of Noetic Science, California). A meta-analysis of the replication studies conducted by these researchers revealed an overall success rate of 33.2% with an associated probability greater than one million billion odds against 1.[54] Up to now, about 50 researchers from several countries have succeeded in reproducing these results, and other meta-analyses have confirmed the existence of telepathy when it is studied using the Autoganzfeld protocol.[55]

Some might argue that a 33% success rate (eight points above chance) is not so impressive. However, it should be noted that, in general, all psi effects are relatively small when data are obtained from participants with no particular abilities. Nevertheless, when special populations are tested, higher success rates are measured. For instance, a 47% success rate was reported when the Autoganzfeld protocol is tested with artists.[56] In addition, psi researchers have discovered that the more the sender is captivated by the video clips, the more the receiver is able to capture the target. This is not the case for static images, which produce lower scores.

The Future in the Present

Research on remote viewing and telepathy shows that it is possible to acquire information independently of space without the use of the ordinary senses. Other psi research on presentiments – vague impressions that something is going to happen, but without being aware of what it might be – indicates that it is also possible to collect information about events that have not yet occurred.

There are several famous anecdotes about presentiments. Some of them are about Winston Churchill, who was Prime Minister of the United Kingdom from 1940 to 1945, and from 1951 to 1955. One evening, during the Second World War, Churchill invited three ministers of his government to dinner at 10 Downing Street. During the meal, a German raid began in London. Accustomed to sirens, Churchill and the three ministers continued to eat calmly. Then, all of a sudden, the Prime Minister got up from the table and went to the kitchen, where two of his housekeepers were working near a window. Churchill then ordered them to go down to the shelter. A few minutes later, a bomb crashed on the Prime Minister’s residence, destroying

the kitchen completely.

During the Second World War, Winston Churchill usually visited the anti-aircraft batteries that defended the British capital against German bombers. One night, after talking to the soldiers, he was about to leave them and headed for his vehicle. As usual, the right door at the back was open because this is where Churchill always sat. But this time, he decided against it and sat on the opposite side. The very next moment, a bomb exploded on the right side of the vehicle. The Prime Minister escaped unscathed. Later, he confided to his wife that a kind of inner voice whispered to him not to sit in his usual place.[57]

While presentiment is a vague impression, premonition is a belief that something will happen in the future. In some cases, a premonition manifests itself through dreams, known as premonitory dreams. A famous example of this type of dream was reported by David Booth, an office worker in Cincinnati, Ohio. For 10 nights in May 1979, Booth had the same nightmare: he saw an American Airlines DC-10 plane hesitate to take off, and he heard the sound of the huge engines losing speed. He saw the plane nose up, then lose altitude before crashing to the ground. The plane became engulfed in flames right away – gigantic luminous flames, followed by thick black smoke. David Booth always woke up at that moment... On May 22, he called both American Airlines and the Federal Aviation Administration at Cincinnati International Airport. Four days later, an American Airlines DC-10 crashed over Chicago International Airport. Almost 300 people were killed – one of the worst air disasters in US history.[58]

Dr. Larry Dossey, who coined the term “non-local mind,” proposed that presentiment, the perception of which sometimes seems irrational, relies on physical sensations – anxiety without apparent cause, unpleasant impressions – and is a warning system to protect us from danger. In this respect, Dossey cited the works of William Cox. In the 1950s, this researcher and businessman studied the visitor numbers in train accidents. He discovered that they usually had fewer passengers on board than the trains that reached their destination without any problem. Thus, on June 15, 1952, the day of its accident, the *Georgian* of the Chicago and Eastern Illinois Railroad had only nine travelers, while it carried an average of 62 people just days earlier.[59]

Experimental studies of precognition – the knowledge of information regarding future events – have been conducted for more than 80 years. In the first experiments, the participants had to guess which of the potential targets

(for example, faces of a die, a colored bulb among several, or symbols on Zener cards) would subsequently be chosen randomly. A meta-analysis including more than 300 studies (published between 1935 and 1987) of precognition that used such targets has produced a probability of one out of 10^{25} (10 million billion)[60] that the results of these studies are due to chance. It therefore seems legitimate to exclude chance in the explanation of these results.

A few decades ago, Dean Radin conceived an experimental protocol to study presentiments. His hypothetical question was: are future emotional states (or future sensations) detectable in the current activity of the nervous system? In this protocol, participants sit on a chair in front of a computer screen. An electrode is attached to the middle finger of their left hand to measure their heart rate and the blood volume at the end of that finger. In addition, a sensor is attached to the thumb or forefinger of their left hand. This sensor records the fluctuations of the conductance of their skin, which is an index of emotional reactivity. Participants hold a computer mouse in their right hand and press the mouse button when they are ready to begin. Immediately, the computer randomly selects a target photo from a bank of 120 images. The computer screen remains blank. Then, after five seconds, the selected photo is displayed on the screen for three seconds. Then the screen turns white again (for 5 to 10 seconds). This step is followed by a rest period of five seconds. After this rest period, participants must press the mouse button again when they are ready for a retest.

During a session, 40 images were presented to participants. One of the categories of images (e.g., erotic images or autopsies) provoked strong emotional reactions, while the other category of images (such as pleasing images of landscapes and scenes of nature) was intended to provoke a state of serenity. The three types of physiological measures were averaged for all “emotional” and “calm” trials.

In keeping with what psychophysiological research on emotions has shown, seeing emotional images resulted in deceleration of heart rate, decreased blood volume, and increased skin conductance. However, what is fascinating is that the psychophysiological responses to emotional images started even before these images were presented on the screen, in other words, as soon as the mouse butt on was pressed. At the end of the experiment, participants were asked if they had been aware of the images that were going to be presented. Most said they were not aware. For Dean Radin,

this indicates that presentiment and our reactions are largely an unconscious process. The unawareness of our reactions makes them possibly more effective, according to Radin, because it allows that to circumvent the psychological defenses likely to block psi perceptions.

In total, Dean Radin and his colleagues conducted four experiments on presentiment. The probability that the results of these experiments were due to chance was one in 125,000.[61] Radin's results were reproduced by psychology researcher Dick Bierman. In this replication study, participants were scanned using a functional magnetic resonance imaging (fMRI) device as they focused their attention on images projected by a computer. These images were chosen randomly. The results showed that specific regions of the brain involved in emotions were activated before the emotional images appeared.[62] These results indicate that the brains of the participants in this study responded to events that were not yet actualized.

Forty studies conducted in several different laboratories have made it possible to reproduce the results obtained by Radin and Bierman. These studies included physiological measures such as electroencephalography (EEG), the signal dependent on cerebral blood oxygen level (fMRI), heart rate, pupillary dilatation and skin conductance. A meta-analysis of these studies confirmed that we can sometimes unconsciously perceive our future.[63]

In 2011, Daryl Bem, Professor Emeritus and a recognized psychology researcher from Cornell University, published a study in the *Journal of Personality and Social Psychology* (JPSP) that included nine different protocols aimed at testing precognition.[64] In all, a thousand university students participated in the study. In one of the protocols, the following instructions were presented to participants:

> *This is an experiment that aims to test ESP. It takes about 20 minutes and its progress is managed entirely by the computer. First, you will have to answer a few questions. Then, for each test, two curtains will appear on the screen, one next to the other. One of them hides an image; the other conceals an empty wall. Your task is to click on the curtain that seems to hide the image. This one will open to allow you to see if you have selected the right curtain. There will be a total of 36 trials. Many of the images have explicitly erotic content (for example, couples having consensual and non-violent sex).*

The purpose of these instructions was to make participants believe that they were participating in a clairvoyance experiment. But in fact, the images and their position (right or left) were determined randomly by the computer after the choice of participants. As the location of the images was chosen randomly, participants theoretically had a one in two chance of locating each erotic image. However, participants were able to locate erotic images 53.1% of the time (instead of 50%). These results were statistically significant. As for emotionally neutral images, the success rate did not deviate from what could be expected from chance.

The results of the studies reviewed in this section of Chapter 2 confirm that it is sometimes possible to gain access, consciously or otherwise, to information from the future. These results, which bring us to question the notion of time, suggest that certain areas of the human psyche can "travel" along the temporal continuum. About our conception of time, Einstein asserted that, "Time does not flow in one direction," and then, "The distinction between past, present and future is an illusion."[65] Maybe physicist Philippe Guillemant, a researcher at the CNRS, is right when he theorizes that our future is already realized in multiple versions that coexist simultaneously, but in a state of potentials not yet experienced.[66]

Chapter 3

When the Mind Influences Matter

Not only is the Universe stranger than we imagine, but it is stranger than we can imagine.
Arthur Eddington

The preceding chapters have shown that we can have access to information, beyond space and time, and without using our ordinary senses. Can one also mentally influence the physical world by using what parapsychologists (also named psi researchers) call psychokinesis (PK)?

Researchers have been looking at this fascinating issue for many decades. These psi researchers distinguish between macropsychokinesis (or macro-PK) and micropsychokinesis (or micro-PK). Macro-PK is a macro-physical psychokinesis, that is, it refers to objects or systems large enough for direct observation. As for micro-PK, it refers mainly to psychokinesis exerted on random microphysical systems (for instance, electronic noise).

Macro-PK can be revealed through the levitation and displacement of small objects (telekinesis), spoon bending, reshaping and bending of metal rods as well as through psychophotography (the mental impression of a photographic film). The experimental investigations of macro-PK have not always been carried out in a rigorous and systematic way. Furthermore, the results are ambiguous and certain subjects of experimentation have been outed as frauds. Given this, I will concentrate mainly on micro-PK in this chapter.

Dr. Joseph Banks Rhine was the first scientist to use statistical methods to study micro-PK. One day, during the 1930s, when JB Rhine was a professor at Duke University in Durham, North Carolina, a gambler paid him a visit. The latter told Rhine that he thought he was sometimes able to mentally influence the results of dice games. The belief in such an influence on dice was something widespread and old. JB Rhine realized that it would be easy

and inexpensive to test this belief. As the preliminary results with the gambler in question proved promising, Rhine decided to carry out further research.[67]

This research program lasted for several years. Rhine tried to systematically eliminate the biases originating from unbalanced dice. Hence, the dice were first placed in special cups to prevent participants from manipulating their throw. The dice were then placed in power-driven rotating cages. During the experiments, the participants were asked to mentally "direct" the throw of the dice in order to unveil the face that had been pre-selected. A new face was chosen only after several throws.

In the early 1990s, parapsychology researchers Dean Radin and Diane Ferrari performed a meta-analysis of 73 micro-PK studies based on the protocol developed by Rhine.[68] These studies, carried out mainly in the 1940s and 1950s, had been conducted by 52 different researchers. The meta-analysis included 148 experiments covering 2.6 million dice throws. These experiments produced a relatively small but highly significant effect (probability of one in one billion). When there was no intention applied to the falling of the dice during the control condition, no significant effect was detected.

Micropsychokinesis and Random Number Generators

Helmut Schmidt, a physicist working at the Boeing Laboratory in Seattle, created random number generators (RNGs) in the late 1950s to study the possibility that the human mind could interact directly with matter. Based on quantum processes, an RNG is a circuit that randomly produces peaks of electronic activity hundreds or even thousands of times per second. The electronic activity generated by the RNG is converted into random bit sequences, 0s and 1s. In a typical experiment, participants are asked to try to mentally influence the results of the RNG so that this device generates more 0s than 1s (or vice versa). During the control condition, participants do not mentally influence the activity of the RNG.

Typically, participants perform hundreds of rounds of tests, and they can receive feedback on the distribution of random events in the form of sounds or graphics. Contemporary RNGs are small devices connected to a computer *via* a USB port. All aspects of RNG experiments – including the presentation of instructions, the feedback provided on a trial-and-test basis, and the recording and analysis of data – are now automated.

Over the last 50 years, several hundred RNG studies have been carried out. In 1989, Dean Radin and psychology researcher Roger Nelson of Princeton University worked on a meta-analysis of studies conducted between 1959 and 1987. This statistical analysis included 597 studies that had been conducted by 68 different researchers. Meta-analysis of these 653 tests revealed that the probability of the results of these tests being due to chance was one in 33 million.[69]

More recently, engineer Robert G. Jahn and his colleagues at the PEAR Laboratory published a meta-analysis based on twelve years of RNG experiments conducted by their research group.[70] These experiments involved more than 100 participants, who had been instructed to attempt to intentionally influence the data produced by an RNG by either moving them up the hazard curve (the "high" condition), or below the hazard curve (the "low" condition). The results showed that the RNG data was higher when participants wanted high scores, while the data dropped more when participants wanted low scores. Even if the effects recorded were not very significant, all the results produced a probability of 35 billion against one. In certain PEAR experiments, participants were thousands of kilometers away from the RNG. Nevertheless, there was no decrease related to distance.

Robert Jahn and his colleagues also conducted macro-PK "placement" studies. These studies aimed to determine whether human intention can affect the movement of macroscopic objects. To achieve this, the researchers used a random cascade mechanism. It was actually a 10-foot high experimental device that allowed 9,000 polystyrene balls to fall through a matrix of 330 tees. The balls were distributed into 19 boxes. A photoelectric process was used to count these balls as they entered the boxes. Participants were asked to focus and try to mentally shift the distribution of the balls to the right or left, relative to a normal control distribution. Overall, more than 300 experimental sessions were conducted with about 20 different participants, and slightly significant results were obtained.[71]

Collective Attention Effects

Micro-PK studies indicate that when an individual directs his attention and intent to random physical processes, such as the falling of a die or the "behavior" of an RNG, these processes no longer operate totally randomly. In this context, it is legitimate to ask the following question: what happens to the micro-PK effect when several individuals are involved?

In the mid-1990s, while still a PEAR affiliate, Roger Nelson decided to explore this important issue using RNGs. His work, and subsequent replication studies by other parapsychology researchers, suggest the existence of a "collective attention effect." Such an effect could be linked to the creation of "fields of consciousness" (these fields are designed in a similar way to the classical concept of field in physics).

A field of cosmic consciousness would permeate space and time. This is quite an ancient concept, first put forward by the Vedic sages (rishis) of ancient India who posited that there is a field of pure consciousness or universal Self, which they called Brahman. This field of cosmic consciousness would encompass all individual human consciousness.

As Dean Radin points out[72] the notion of field of consciousness is related to the subjective impression that individual thoughts, which are aligned and coherent, seem to merge into a group thought. This would occur when a group of individuals are on the same "wavelength," for example, during religious rituals or while visiting sacred places. A field of consciousness could also be created when a group of people sing in chorus or attend a moving speech. In such moments, it is as though the normally dispersed attention of group members becomes focused and a collective mental coherence sets in. In such moments, microphysical changes can apparently be detected in the local environment.

So far, more than a hundred studies of collective attention effects have been conducted using RNGs. In these studies, RNG activity is measured continuously, while groups of individuals are involved in stimulating activities. It should be noted that the experimental protocol of these studies does not imply that participants must specifically focus their intention, or direct their attention, towards the RNG. In terms of data analysis, scientists are looking for significant deviations from the sequences of numbers normally generated randomly. Thus, in a sequence of 1,000 bits, generated in a purely random manner, and without the RNG being influenced in any way, 500 0s and 500 1s will be obtained (with a perfectly calibrated RNG). With a group awareness effect, there should be more 0s or more 1s than expected due to chance alone.

The probability that the results of these studies are due to chance is one chance in more than one million: The effect of collective attention does seem to exist. However, the results of these studies vary widely. This is likely due to differences in group composition, activities by members of these groups,

and environmental contexts.[73] Dean Radin proposed that this inter-study variability could also be related to the difficulty of determining exactly when collective mental coherence appears. To explore this possibility, he worked with Skip Atwater, former Director of Research at the Monroe Institute in Virginia. Radin and Atwater wanted to specifically investigate whether the binaural sounds of the Hemi-Sync method, which was developed by this private institute, can promote group awareness effect.[74]

When listening to two slightly different sonic frequencies with stereo headphones, for example, 500 Hz in the right ear and 495 Hz in the left ear, the neurons of the auditory system process these sounds so that the individual with the earphones hears a third sound that results from the difference between the two frequencies, or 5 Hz. It is this differential frequency that constitutes what is called a binaural sound.[75] Research at the Monroe Institute indicates that binaural sounds induce brainwave synchronization in both hemispheres. The Hemi-Sync method promotes, among other things, relaxation and stress reduction.

The research by Dean Radin and Skip Atwater was conducted during the *Gateway Voyage*, an intensive six-day program at the Monroe Institute. The purpose of this program is to enable participants to explore and develop different levels of consciousness. During this program, for several hours daily, the participants – usually about twenty – listen separately, each in their room, to various binaural sounds associated with the Hemi-Sync method. After listening to these sounds individually (with stereo earphones), participants gather for 45 minutes to discuss their experiences. The cycle of sound listening-discussion is repeated several times a day during the entire duration of the program.

Radin and Atwater speculated that listening to binaural sounds should lead to the same type of brain rhythms in each participant, and that this could produce collective mental coherence. While assuming that the collective attention effect does exist, Radin and Atwater also hypothesized that such an effect should be more apparent during binaural listening sessions than during meals or when participants sleep. In order to test this hypothesis, these researchers performed correlation analyses of the RNG data collected over 14 weekends. Most program participants were unaware of the application of RNG during the research. For the control condition, RNG data were collected during eight weekends, while there was no program at the Monroe Institute.

In all, 108 billion random bits were produced and stored. Correlation

analyses confirmed the hypothesis of the two researchers, i.e. a statistically significant effect was measured during the programs (probability that the results were random: one chance out of 500), while no significant effect was noted during the control condition. In addition, data produced by an RNG found at a distance from the location of the programs showed no effect.[76]

Studies by Nelson, Radin, and other researchers in the field of psi suggest that some factors influence the magnitude of collective attention effects. First, collective attention and collective mental coherence would be greater when the attention of group members is focused on the same object or event. The number of individuals in the group would be another factor influencing the magnitude of such effects.[77]

Masaru Emoto and the Sensitivity of Water

Masaru Emoto, who died in 2014, was a Japanese author and internationally known independent researcher for his theory of the effects of thought and emotions on water. After studying international relations, Emoto obtained a PhD in Alternative Medicine from Yokohama University. Fascinated by water, Masaru Emoto was also President of *Project of Love and Thanks to Water*.

Emoto developed, with the help of some collaborators, a method of observing water crystals frozen by photography. In this method, crystallization is achieved by freezing water samples in Petri dishes for three hours. Droplets of ice subsequently form on the surface, and the water crystals appear under a projection of light. It is then that a photograph of the crystals is taken at a fast speed. With this method, Emoto discovered that the crystal structure varies greatly depending on the source of the water. Thus, the pure and vivid waters form breathtaking and harmonious crystals, while the stagnant or waste waters do not form crystals and if they do happen to form crystals, they are incomplete and disharmonious.

Using this method, Masaru Emoto tested the sensitivity of water against the “energy” emitted by thought and emotions, speech, image and music. His work revealed that crystals react by structural changes to different influences. Thus, even simple words written on paper (for example, “hate” and “love”) presented to water change the shape of the crystals in a specific way. In general, the tests conducted by Emoto and his colleagues revealed that beautiful music (for example, that of Johann Sebastian Bach), as well as thoughts, emotions and positive words lead to the formation of beautiful

crystals. On the other hand, negative thoughts, emotions and words, as well as hard rock, lead to the formation of deformed and aesthetically unattractive crystals.

The results of the work of Emoto and his team have been published in a few books showing photographs of various water crystals in a variety of situations.[78] Emoto and his work became famous after his experiments on water molecules were included in the film *What the Bleep Do We Know!?*

Later on, Masaru Emoto, who did not have a traditional scientific background (some skeptics did not hesitate to call his discovery a sham), began to collaborate with the highly regarded Dean Radin. The latter made sure to eliminate the main methodological weaknesses that characterized Emoto's preliminary work. Thus, the possible waiting effects on the part of the photographer, the judges and the data analyst were controlled by using a blind procedure. In a first study,[79] a group of about 2,000 people in Tokyo was asked to focus on the idea of having positive intentions toward water samples in an electromagnetically shielded room at the Institute of Noetic Sciences in Petaluma, California. Participants were unaware that there were identical water samples that had been placed elsewhere in this institute.

The ice crystals formed from the two sets of water samples were blind photographed. In addition, the images obtained were blindly evaluated for aesthetic appearance by 100 independent judges. Ice crystals formed from "treated" water were judged to be significantly more beautiful by the judges.

In a subsequent replication study by Radin, Emoto and their colleagues[80] 1,900 people in Austria and Germany sent their intention to two bottles of water in the electromagnetically shielded room at the Institute for Noetic Sciences. As in the previous study, two control bottles had been placed elsewhere at the institute. After the water was frozen, crystallized, and the photos were taken, 2,500 independent judges blindly assessed the beauty of the crystals. A similar result was obtained – the treated water crystals were found to be more beautiful – symmetrical, well formed, and attractive – than the crystals formed from the control water.

Since the human body is 70% water, it is easy to understand why the implications of these studies for our health can be important.

The Observer Effect in the Quantum World

The micro-PK studies conducted with RNGs suggest that it is possible to mentally influence processes taking place in the microphysical world. One of

the biggest oddities of this world is the fact that a quantum object behaves like a wave indefinitely until it is observed. As if the quantum object in question knew that it is being observed. This quirk is indicated by a double-slit interferometer. It is a device that sends particles of light (or photons, but this is also true of electrons and elementary particles) through a wall pierced with two small parallel slits and records the patterns of light that appear on a screen behind the slits. Insofar as the photons behave like tiny, separate beads, the patterns of light should always feature two bands of light. This is what is actually recorded if we follow each photon as they pass through the slits. However, if we do not follow the path of the photons, we observe a diffraction pattern, an area where dark and illuminated fringes alternate (called interference fringes). Such a pattern illustrates the wave-like character of light. It thus has a double nature: it is both wave and corpuscle. And how it manifests itself depends on how one seeks to apprehend it. This mysterious phenomenon is called by physicists the "problem of measurement."[81]

There are other QM concepts that are closely associated with this phenomenon. The "wave packet reduction" (or "wave function collapse") is one of these concepts. According to QM, a physical system has multiple possible states but physically not manifested – these states are said to be superimposed — when this system is not observed and measured, disturbed by an observation/measurement. When an observation/measurement is made, the superimposed states must collapse into one and only one possibility. In other words, the observation not only disturbs what is measured, it also produces the effect.[82]

The problem of measurement defies common sense since it calls into question the assumption that there is an objective reality totally independent of the observers. This problem has deeply shaken what physicists believed about the physical world. To illustrate the strange and problematic nature of this phenomenon, Erwin Schrödinger, one of the fathers of the QM, imagined in 1935 a famous thought experiment. This thought experiment is called "Schrödinger's Cat." In this famous experiment, we imagine a cat locked in a box with a deadly device. This device is designed to release cyanide if a radioactivity detector detects the disintegration of a radioactive atom. Since an atom has a one in two chance of disintegrating over a period of one minute, the probabilistic equations of the QM describe the fate of the cat as 50% alive and 50% dead. These equations thus illustrate a superposition of two states. If an observer opens the box, they decrease their ignorance about

the cat's state of health – which corresponds to the collapse of the wave function – and discovers whether the latter is 100% alive or 100% dead.[83]

The problem of measurement and the effect of the observer have led several famous physicists – such as Bohr, Pauli, Schrödinger and von Neumann – to think that consciousness plays an important role in shaping the physical world. Most physicists reject this idea and opt for other theoretical avenues to explain the problem of measurement. However, some theoretical physicists have gone even further than the fathers of QM. Thus, John Wheeler proposed the "Participatory Anthropic Principle." According to this principle, the presence of observers is necessary for the Universe to exist. In other words, consciousness must have existed before the appearance of the physical world.[84]

To learn more about the role of consciousness in the collapse of the wave function in QM, Dean Radin and his colleagues used a double-slit optical system a few years back.[85] These researchers hypothesized that the intensity of the interference pattern produced by this optical system would decrease when participants in the study would focus their attention on the double slit. A total of 137 volunteers took part in this study and 250 test sessions were conducted. Each session consisted of 40 trials (varying between 15 and 30 seconds). For each of these trials, participants were asked to focus either on the double slit (the experimental condition), or away from the double slit (the control condition). The data collected revealed that, on average, the intensity of the interference figure decreased significantly in the expected direction (probability of 184,000 against one). In addition, the researchers conducted 250 control sessions without any observer. These sessions were intended to detect the presence of potential artifacts (for instance, related to equipment and methods of analysis). No effect was detected. These results, which were published in the journal *Physics Essays* in 2012, support the interpretation of QM according to which consciousness is related to the problem of measurement. In addition, Radin and his colleagues found that factors such as experience in meditation, the degree of focus of attention, and open-mindedness were correlated in a predictable direction with the intensity disturbances of the interference figure.

More recently, Radin and colleagues conducted another study using a similar double-slit optical system and experimental protocol.[86] The objective of this new study was to determine whether the "non-physical" interaction proposed by some physicists is better interpreted as an active influence of

consciousness or as a passive form of observation. This time, the experiment was conducted on the Internet by sending the data of the double-slit system to the web browsers of the participants. In all, 1,479 people from 77 countries participated in 2,985 experimental sessions. These participants had to either focus their attention or not on a signal that represented in real time the level of interference produced by the optical system. The results were similar to those of the previous study. Remarkably, these results also showed that the direction of the effect, which was consistent with the intent of the observers, was not affected by the distance between the participants and the double-slit system (this distance ranged from 1 km to 18,000 km). On the other hand, no effect was observed in more than 5,000 control sessions recorded by a computer simulating a human participant.

Is the Brain a Quantum System?

In the 1930s, John von Neumann, the Hungarian-American mathematician and physicist, was the first to propose that in QM the observer of a measurement is not only the instrument that is used but also the consciousness of the physicist who notes this measurement. This idea was taken up decades later, first by Eugene Wigner, followed by Henry Stapp, a theoretical physicist working at the University of California, Berkeley. Stapp developed a model postulating quantum effects in neuronal ion channels. When these channels open, the neurotransmitters are released into the synaptic cleft. Since synapses enable the creation of neuronal assemblies, and these structures are closely related to mental processes, Stapp proposes that these structures can trigger quantum effects in ion channels. Considering that the diameter of these channels is one nanometer (10^{-9} meter), this physicist also proposes that these channels belong to the microphysical world, and that their activity is governed by the rules of QM. Furthermore, Stapp argues that a goal-oriented attention effort directly modulates the reduction of the wave packet associated with the activity of the ion channels. This would be how free will is implemented in the brain.[87]

There are other models of mind-brain interactions that are based on QM. For example, neuroscientist John Eccles and physicist Friedrich Beck suggested that the probability of release of chemical messengers from presynaptic vesicles – the small membrane vesicles at the synaptic junction of neurons that contain chemical messengers – is regulated by quantum processes. This hypothesis is based on the fact that the extremely small size

of the synaptic vesicles is comparable to that of other structures and phenomena studied by QM. Furthermore, Eccles proposed that dendrites – the branch-like extensions of a neuron that conduct electrical impulses from adjacent neurons to the cell body – act as the basic receptor units of the cerebral cortex (the mantle of grey matter covering the surface of the cerebral hemispheres). Sets of dendrites (or "dendrons") are linked to units of mental experience (or "psychons"). During intentional and voluntary thoughts, psychons would act on the dendrons by temporarily increasing the likelihood of release of neurotransmitters *via* presynaptic vesicles.[88]

Neither Stapp, nor Eccles nor Beck attempted to explain the mind and consciousness in quantum terms, unlike the English physicist and mathematician Roger Penrose and the American anesthesiologist Stuart Hameroff. Penrose does not believe in the concept of wave function collapse. His proposal is to replace this QM concept with that of "objective reduction." The latter would be of a gravitational and non-local nature – it would be based on remote effects and would make it possible to establish a quantum coherence between spatially distant objects. According to Penrose and Hameroff, objective reduction would occur at the microtubule level in the brain. These are tiny tubes (about 25 nanometers in diameter) made of spirally wound proteins (called tubulin). Microtubules serve as a structural support for neurons as well as for all the cells of the body. Tubulin molecules can be either in an elongated state or in a contracted state. For Penrose and Hameroff, a superposition of quantum states would explain this phenomenon. On the other hand, the very small size of microtubules, their spiral protein structure and the fact that these organelles are relatively isolated from the external environment provide all the essential conditions for promoting quantum coherence.[89]

According to Penrose and Hameroff, their model would explain the unity of consciousness and the origin of free will. Philosophers Rick Grush and Patricia Churchland strongly disagree and have raised several objections that are difficult to circumvent. First, microtubules are found not only in the human brain, but also in all animal and plant cells. Then, several anesthetic substances act without these organelles being affected and the destruction of microtubules does not lead to major effects on the consciousness. Finally, there is no evidence that these organelles are involved in central changes in states of consciousness such as the wake-sleep cycle.[90] I would add that the Penrose-Hameroff model is another attempt to reduce the mind to physical

processes. An attempt that has failed. Instead of the electrochemical activity in neurons or neuronal assemblies, it is alleged quantum processes in microtubules that would be the source of mental activity. It is a model that is even more reductionist than most materialist theories, which are content to reduce the mind to cellular or molecular levels.

A Device Supporting Intention?

William Tiller is Professor Emeritus of Stanford University's Department of Materials Science and Engineering. He has also been director of that department. During his long scientific career, which focused mainly on crystallization mechanisms, Tiller published some academic books and more than 200 articles.

This scientist did not feel entirely fulfilled by his official work at the university because he had the impression that his work only touched on a very narrow portion of reality. In parallel with his formal research, William Tiller decided in the 1970s to undertake a research program on the effects of thought on the material world. Eventually, he developed a device that allows us, he says, to record and implement intentions. It is a small electronic device that plugs into an electrical outlet and is placed near the material target that you want to influence. At first, you have to "load" the device with a specific intention. Tiller discovered that this process was effective when a small group of people entered a meditative state and focused for about fifteen minutes on the intention in question.

Using such an experimental protocol, William Tiller did several series of experiments that aimed to change the pH level of water. The pH makes it possible to estimate the concentration of hydrogen ions in an aqueous solution and measure the acidic or basic nature of this solution. The more acidic the solution, the lower the pH value and *vice versa*. The purpose of the first experiment was to increase the pH of 1. A few months after switching on the intention device, Tiller observed that the pH of the water had risen by 1. For the second experiment, the goal was to lower the pH of the water by 1. This goal was also achieved. The results of these experiments were published. Afterwards, these results were reproduced by research groups in London, Milan and the University of Florida.

Physicists are familiar with atoms, protons, electrons, and the four fundamental forces present in nature: gravitation, electromagnetic interaction, strong nuclear interaction, and weak nuclear interaction. However, to

understand the results of his experiments with the intention host device, William Tiller believed that it is necessary to go beyond QM, the fundamental forces and the physical world known today, by imagining the existence of subtle energies and forces which still evade science.[91]

Chapter 4

The Non-Local Influence of Intention on the Living

There are only two ways to live your life. One is as though nothing is a miracle. The other is as though everything is a miracle.
Albert Einstein

The studies presented in Chapter 3 demonstrate that we can influence the microphysical world non-locally. Other studies, which we will examine in this chapter, indicate that the human mind is also capable of bio-psychokinesis (bio-PK) – a non-local action on organic matter and living things.

The scientific investigation of bio-PK began in the 1960s. One of the pioneers in this field of research, Cleve Backster, was not a researcher, but rather a lie detector (or polygraph) specialist who worked for the CIA. One morning in February 1966, during a coffee break, this former member of the US Army Counterintelligence Service decided to water the plants in his office. Among them was a dragon tree – a plant with a very long stem. Inquisitive, Backster wondered, as he filled the watering can, how long it would take the water to travel from the roots to the leaves of the dragon tree. He decided to find out. For this purpose, he inserted one of the leaves of the plant between the two electrodes of a polygraph, then he tied the whole thing up with an elastic band. When the water reached that part of the leaf between the electrodes, the humidity would rise, leading to a drop in the electrical resistance of the leaf. This decrease would result in a rise in the outline of the printed paper roll of the polygraph.

Contrary to what Backster had anticipated after pouring the water, the curve slumped, similar to when a person experiences the fear of being caught in their lie. The CIA polygraphist wondered at that point whether a plant

could react emotionally. If that were true, he thought, threatening the well-being of the plant would probably heighten the reaction of the outline. Backster decided to use a match to burn the leaf attached to the electrodes. Immediately, the plotter pen of the drop-down paper of the polygraph shot up. It was as if the plant had been terrified after perceiving Backster's menacing thought. The polygraph expert then went to his secretary's office to pick up matches. The polygraph still showed the alarm response of the plant when Backster returned to his office. He then lit a match and brought it close to the leaf – the tracer pen continued to show the alarm response. The polygraph expert then returned the matches to his secretary and the line gradually normalized.

For Cleve Backster, the extraordinary phenomenon he had just observed proved that plants possess some kind of psi perception. He named it "primary perception." This type of perception would make plants receptive to the thoughts and intentions of human beings. During the following decades, Backster performed a significant number of experiments that confirmed the existence of this primary perception in plants.[92]

Almost at the same time as Cleve Backster made his discovery, a chemist named Robert Miller performed an experiment that suggested that human intent could affect plants, not just in their immediate environment but also remotely. Miller was conducting research to determine the extent to which lighting variations affect the growth rate of rye. To carry out this investigation, Robert Miller used a device to measure the growth rate of this plant with an accuracy of thousandths of centimeters per hour. When lighting, temperature and irrigation were kept constant, the growth rate of the rye was relatively stable (0.0152 cm per hour). In 1967, Miller asked the spiritual healer Olga Worrall and her husband Ambrose – who treated their patients remotely through prayer – to try to mentally influence the growth of a single rye shoot, from their home, which was located 800 kilometers away from Robert Miller's laboratory. They settled on a date. On that day, at 9 o'clock in the evening, the couple visualized the rye shoot growing fiercely, enveloped in white light. The following day, Miller discovered that before the Worralls began to "pray" for the plant, the pattern produced by the device showed a slight slope that represented a normal growth rate. However, this outline began to deviate upwards at exactly 9 o'clock the previous evening, and at around 8 o'clock the next morning the growth rate was 0.1344 centimeters per hour, an increase of more than 800%.[93]

Following his chance discovery, Cleve Backster conducted many experiments demonstrating that cut or crushed leaves, as well as different organic materials – for example, eggs, yogurt and smear test of the palate – react to human intentions and emotions. Some of these experiments indicated that oral leukocytes (white blood cells from the mouth of a person) placed in a test tube react electrochemically to the emotional states of the donor, even if the donor is in a distant room, another building, or even another country.[94]

Similarly, physicist William Tiller and his colleagues used the device to record and implement intentions, and the protocol described in the previous chapter, to non-locally affect various biological processes. One of the experiments targeted the activity of enzymes, those proteins that catalyze chemical reactions in cells. Human liver enzymes were then harvested. The results showed a 30% increase in the level of activity of these enzymes. The purpose of another experiment was to measure the non-local impact of intention on the rate of development and maturation of fly maggots. In this experiment, the thoughts of the meditators were to increase the amount of adenosine triphosphate (or ATP) – the main source of energy at the cellular level – in maggot cells. Tiller and colleagues measured a 15% increase in ATP levels in these cells. This increase was associated with a shorter maggot development time, by almost 25%.[95]

Jean Barry, a French doctor from Bordeaux who had also been president of The Institut Métapsychique International (IMI), is another pioneering researcher on bio-PK. Barry tried to determine if it is possible for humans to mentally inhibit the growth of a fungus that can cause an infectious disease. In this experiment, the genetic purity of the fungus, which was grown in Petri dishes (a laboratory incubator), was controlled. The environmental conditions (temperature, humidity, and lighting) were identical for the boxes chosen to be influenced at random and for the boxes of the control group. Ten individuals were part of the experiment. During each session, five experimental boxes and five control boxes were assigned to each participant – they were seated five feet away from these boxes. They were asked to only focus their attention and intention on the five experimental boxes for fifteen minutes. At the end of each session, the boxes were weighed and compared. If the experimental boxes were lighter than the control boxes, a success was recorded, and if they were heavier, it was a failure. For 151 of the 195 sessions performed as part of this experiment, the growth of fungus in the experimental dishes was significantly lower than that of the control boxes.[96]

Another interesting bio-PK study was led by psychologist William Braud while he was working at the Mind Science Foundation in San Antonio, Texas.[97] In this study, during every session, Braud asked participants to visualize the slowing down of the rate of hemolysis (destruction) of red blood cells in human blood, found in test tubes in a remote room. Nine out of 32 participants managed to significantly reduce the hemolysis rate of red blood cells in the tubes. The results also revealed that this effect was more pronounced when it came to their own blood.

Other studies have tested the ability of individuals to modify the physiological activity of an animal. For example, researchers at the Institute for Parapsychology, in North Carolina, have examined bio-PK by assessing how long anesthetized mice took to wake up.[98] The mice were first put in pairs. The two members of the same pair were of the same sex, of the same mother, and they were of similar size. One mouse was selected to be part of the experimental group, while the other belonged to the control group. The mice in both groups were anesthetized with ether, and the study participants only had to focus on mice in the experimental group. Two series of tests were carried out. In the first one, the participants were close to the mice but could not touch them. In the second set of tests, the participants were in another room and observed the mice in the experimental group through a one-way mirror. The results were significant for both sets of trials: the treated mice woke up faster than the mice in the control group.

Non-Local Effect of Intention on Others

Other studies have sought to evaluate the non-local effect of sender intent on the physiological activity of a person (the receiver) located at a distance – this experimental design is called a transceiver protocol. In these studies, the receiver, who is asked to remain calm and relaxed, is unaware for how long the sender “is sending” an intent, and at what moments he is doing so. Charles Tart, a psychology researcher at the University of California in Davis, is one of the pioneers of this type of study. In the early 1960s, Tart used such a protocol and acted as a transmitter to test whether remote receivers could also react to random electrical shocks he received. The skin conductance, heart rate, and blood volume of the receptors were measured. These physiological evaluations revealed that the receptors reacted significantly to the shocks Tart was subjected to. However, these receivers were completely oblivious of these events. Following the study by Charles

Tart, Jean Barry (in France), engineer Eric Douglas Dean (Newark College of Engineering in New Jersey), and psychologist Erlendur Haraldsson (in Iceland) separately recorded significant changes in blood volume measured at the receiver's finger at the moment when transmitters, in some cases thousands of kilometers away, mentally directed their emotional states towards them.[99]

Psychology researcher William Braud has conducted several studies in the field of bio-PK, and he developed an innovative experimental procedure that he called "allobiofeedback" (from the Greek *allos*, meaning "other"). The traditional approach to biofeedback is to provide the individual who is being examined with information about a specific physiological measure, such as his heart rate. In experiments involving allobiofeedback, the information is provided to the transmitters to enable them to determine the extent to which they can mentally influence the physiology of the receivers located at a distance (in another room). In several of the experiments conducted by Braud and his colleagues, the physiological target selected was skin conductance (or electrodermal response), which reflects the activity of the sympathetic nervous system. A high electrodermal response indicates anxiety or stress. In these experiments, the transmitter observed, on a polygraph, the fluctuations of this response in the receiver, as they attempted to increase or decrease this physiological activity. The influence periods lasted typically for 30 seconds. The target physiological activity during these periods was compared to that measured during control periods without influence. The order of the influence periods and control periods was randomly determined, and the transmitters received the instructions *via* a headset.

The numerous experiments carried out by Braud and his colleagues, using this experimental approach – more than 300 sessions involving 62 agents and 270 receivers – indicated a remote mental influence on skin conductance during periods of influence. In one of these experiments, a first group of receivers had a normal level of skin conductance, while a second group of receptors showed an abnormally high level of skin conductance. The aim of the experiment was to reduce this physiological activity in both groups of receivers. The results showed a more marked reduction in skin conductance in the receivers from the second group.[100]

In other experiments conducted by Braud and his research team, the allobiofeedback was not used. Instead, senders were asked to immerse

themselves in emotionally-charged images, as well as the desire of the intention to reach the receiver; or to imagine that the receiver was in a state corresponding to the intention issued. This different approach has also produced significant results.

William Braud and his long-time colleague, anthropologist Marilyn Schlitz, conducted a meta-analysis of the 37 experiments which they carried out until the early 1990s on bio-PK. These experiments, which involved measuring different physiological responses, included 655 sessions with 153 people acting as transmitters and 449 people (or animals) acting as receivers. The combined results of these various experiments generated a probability of one hundred billion against one.[101]

Researchers Deborah Delanoy and Sunita Sah from the University of Edinburgh conducted a variant of the experiment popularized by Braud. The purpose of their study was to verify if the receiver can react physiologically to an emotional state experienced by the transmitter. At first, the senders had to identify personal memories capable of inducing a positive and happy state. The senders also had to choose four objects that were emotionally neutral for them. During the experiment, a random process informed senders of sending periods, and assigned them as targets in either a “positive” state or a “neutral” state. For each sending period, the receivers – who were placed in a room 80 feet from that of the senders – had to try to guess the emotional state of the latter (positive or neutral). The skin conductance of the receivers was also measured. Analysis of the results of the 32 sender/receiver pairs revealed that the receivers showed no particular ability to consciously perceive the emotional states of the senders. However, the skin conductance in the receivers was much more significant during the positive periods. Delanoy and Sah believe that this increase could be an index of unconscious psi reception.[102]

Transpersonal psychologist Jeanne Achterberg, a pioneer in the use of visualization in the healing process, conducted a functional magnetic resonance imaging (fMRI) study to determine what occurs in receivers’ brains when healers direct positive intentions towards them. Eleven healers from Hawaii were paired with 11 receivers. These healers adhered to various therapeutic approaches and were far away when the scans were performed. As with the studies previously analyzed, healers had to connect with the receivers only during certain periods. During the control periods, they did not emit any intention. The results of the study showed significant differences

between the two conditions. As a result, when the intention was sent, there was a significant increase in the level of oxygenation of the blood connected to neuronal activity in different regions of the receptors' brains. This suggests that it is actually possible for healers to connect with people from a distance, and to influence their brain activity.[103]

Can Intention Influence DNA?

When we experience negative emotions or face stressful situations, our heartbeat becomes irregular. Researchers from the HeartMath Institute in California have shown that in such situations, when we learn to breathe calmly, the variations of our heart rate decrease as well as the level of stress. We then experience what is called "heart coherence." This physiological state, which provides a deep sense of well-being, is associated with a resonance between the rhythm of the heart and that of breathing.[104] Glen Rein is a biochemist who was affiliated to the HeartMath Institute for a long time. When he worked there, Rein wondered if individuals achieving high cardiac coherence would be able to modify the structure of DNA through intention.

This biological macromolecule consists of four basic molecules: adenine (A), thymine (T), guanine (G), and cytosine (C). The sequence of these molecules, which work in pairs (A-T and CG), is what carries the code of life. Recently, a team of American researchers working at the Scripps Institute, in La Jolla, managed to implant a third pair of artificial molecules (different from A-T and CG) in the DNA of the bacterium, *Escherichia coli*. What is even more remarkable is that this bacterium was able to replicate the semi-synthetic DNA. This major discovery could eventually lead to huge breakthroughs. Floyd Romesberg, the director of this research team, said on this subject: "If you read a book written with four letters, you will not be able to tell very interesting stories. If you are given more letters, you can invent new words [...] and you will probably be able to tell more interesting stories."[105]

This suggests that living organisms on Earth could have evolved quite differently with DNA consisting of more than four letters. In this context, the discovery of Romesberg and colleagues suggests the possibility of improving the human species, for example by making it more resistant and increasing its longevity.

Romesberg and his team have used sophisticated genetic engineering techniques to complicate the DNA of a bacterium. However, is it possible to

change the helical structure of this macromolecule with only the mind and intention serving as tools?

In order to answer this exciting and daring question, Glen Rein collected DNA samples that were placed in a beaker in front of study participants. They mentally tried to change the structure of the helix. Rein discovered that the higher the degree of cardiac coherence in the participants, the greater the structural changes in the DNA (twisting and untwisting its helix). To achieve a high degree of cardiac coherence, many of the participants generated a strong sense of unconditional love.[106]

Glen Rein also conducted a study with Leonard Laskow, a medical doctor who also works as a healer. In his healing work, Laskow combines unconditional love, directed intention, and mental imagery. With this approach, Leonard Laskow has demonstrated that he is able to slow the growth of bacteria or protect bacteria that are subject to doses of antibiotics.

In this study, Rein prepared five Petri dishes, each containing an identical number of cancer cells, and asked Laskow to make a different intention for each of these boxes while holding them in his hand. Leonard Laskow's task was to inhibit the growth of cancer cells by using different intentions and strategies. The growth rate of the malignant cells was measured by evaluating the amount of radioactive thymidine that they absorbed.

The healer began the experimentation with meditation to enter a state of unconditional love that would foster connection with the cancer cells. The five different intentions and strategies he used were: 1. To allow a return to the harmony and to the normal rhythm of cell growth as it was before they became cancerous; 2. To visualize that once treatment is complete, only three of the cancer cells remain in the Petri dish; 3. No intention is formulated, Laskow lets the will of God operate through his hands; 4. To offer an unconditional love to cancer cells, without specific intention; 5. To visualize the dematerialization of these cells.

The most effective intention/strategy (39% inhibition) was to allow cells to go back to their normal growth. Giving way to the will of God allowed a 21% inhibition. Visualizing that there were only three cells left in the Petri dish resulted in 18% inhibition. Unconditional love without specific intent produced no effect. During subsequent tests with Laskow, Rein discovered that the combination of an intention of a return to the natural order of things, with the visualization that only three cells remained alive in the box, increased the rate of inhibition of cell growth to 40%. Associating mental

images with intention seems to generate better results.[107]

For the last test, Glen Rein asked Leonard Laskow to focus on each of the five intentions/strategies described above while holding five vials of water in succession. These vials were then used to prepare the tissue culture medium necessary for the growth of the cancer cells. Again, water treated with the intention of a return to natural order gave the best results, allowing a 28% inhibition of cell growth. As if the water had "stored" the intentions expressed and communicated them to the culture medium as well as to the cancer cells.

The Sense of Being Stared At

Some researchers, including British biologist Rupert Sheldrake, have conducted experiments to study the sense of being stared at.[108] This is a common phenomenon that occurs frequently in public places with strangers. This impression often leads people to turn around and notice that they were truly being observed.

One of the research protocols that was used by Sheldrake is direct observation. During the tests, the participants must quickly guess, in less than 10 seconds, whether they are being observed or not. Their answers, which are right or wrong, are recorded immediately; a session lasts less than 10 minutes and consists of 20 tests. These direct observation tests, which are easy to perform, were conducted with thousands of participants. Many of these tests were conducted in schools and universities. The results are very consistent and show approximately 55% of correct answers as opposed to 50% chance. This is a result that becomes extremely significant when repeated over the course of several thousand trials. In some of the direct-observation experiments, the participants were tested repeatedly, and the results were revealed to them after each trial. This training approach resulted in a significant improvement in the results.[109]

The other experimental protocol that was used by Sheldrake and other researchers involved separating the observer from the observed; they are placed in different rooms connected by a closed-circuit television system. The use of this protocol began in the 1980s. In these tests, participants are not asked to guess whether they are being observed or not. Instead, their skin conductance is recorded. These tests are composed of random series of tests, during which the observers either look at the image of the participant observed on the TV screen or look away thinking of something else.

Statistically, many of the studies conducted using this research protocol yielded significant results. These results show that skin conductance changes when observers look at the observed, even if the observed participants are not aware of it.[110]

Dean Radin has developed a variant of this experimental protocol to study the impression of being stared at. In this protocol, an electrogastrogram (or EGG) is used to check whether the observed's contractile activity of the gastrointestinal region, a zone particularly sensitive emotionally, can be influenced by the emotions of the observer who is in a different room, located at distance, and is watching a TV screen. EGG activity is measured in an individual who is in a state of relaxation. Meanwhile, in the other room, the other participant playing the role of the observer is watching the TV screen. The image of the person being observed appears as well as, periodically, emotionally positive, negative, neutral or calming video images.

The results showed that EGG responses were significantly greater when the observer experienced positive and negative states compared to at the emotionally neutral state. In other words, the observed's contractile activity of the gastrointestinal region responded to the observer's emotions, even though the pairs of participants (the observer and the observed) were physically separated and could not communicate with each other *via* normal sensory channels.[111]

The psychology researcher Stefan Schmidt, who runs the evaluation section of complementary medicine research at the university clinic of Freiburg in Breisgau, Germany, conducted a meta-analysis of about 30 studies on the non-local effect of intention on the skin conductance of distant human receptors or on the impression of being observed. This statistical analysis confirmed the existence of these phenomena.[112] The meta-analysis also revealed that the magnitude of these was correlated with the quality of the studies: the higher the quality level of the studies, the higher the magnitude of these phenomena.

Distance Healing

In 1975, an English trainee in general medicine suddenly fell ill. She had symptoms suggestive of sepsis and meningitis. Dying, she was admitted to the hospital. The doctors then discovered that she was suffering from the Waterhouse-Friderichsen syndrome – an inflammation of the adrenal glands leading to acute adrenal insufficiency. This is caused by a severe bacterial

infection that is associated with several risk factors. An antibiotic should be introduced at the earliest, together with intravenous therapy. If this syndrome is not treated as quickly as possible, it evolves very rapidly towards a coma and ultimately to the death of the patient.

The evening following the hospitalization of the young woman, individuals gathered and prayed for her to heal completely without residual disability. That night, at the same moment, the condition of the trainee suddenly improved. Doctors noted that the pneumonia that had infected the middle lobe of her left lung had now vanished. They were amazed.

The patient came out of the coma four days later. Upon her arrival at the hospital, an ophthalmologist discovered that there had been a hemorrhage in her left eye, which would cause permanent blindness to that eye. The young woman regained perfect sight of the left eye, as well as perfect health.[113]

This medical anecdote brings about the following question: can prayer for others really heal?

Psychiatrist and researcher Elisabeth Targ was interested in psi phenomena, as well as in the role of spirituality in healing and health and the therapeutic effect of prayer. In 1995, with AIDS still claiming many lives, she and her colleagues at the University of California Medical Center in San Francisco (UCSF) conducted a double-blind pilot study involving 20 advanced AIDS patients. All patients received conventional care, and spiritual healers prayed for 10 of them. These healers lived an average of 2,400 km from the patients. They did not know which group they were assigned to (randomly). As a result, they were unaware whether someone was praying for them. The study lasted six months. Four patients died, which represented a typical mortality rate. When the results were released, the researchers learned that the four patients who passed away belonged to the control group. In other words, the 10 members of the experimental group, for whom prayers were said, were still alive.

Encouraged by these results, Elisabeth Targ decided to conduct a confirmatory study the following year. Forty patients were recruited. They knew that by agreeing to participate in the study, they had a one in two chance to benefit from the prayers of the spiritual healers. Pictures of the 40 participants were taken. The participants were divided into the two groups (experimental and control) randomly, depending on the age, the level of activity of the immune system, and the number of complications related to AIDS. The photos of members of the experimental group were sent to 40

healers (for example, rabbis, shamans, and energy practitioners), while the photos of members of the control group were locked away in a drawer. The healers, who were far from the patients belonging to this group, performed their rituals for one hour a day for six consecutive days. Each week for 10 weeks, the healers switched patients so that each member of the experimental group could benefit from their prayers.

Where the patients were placed was revealed six months after the study started. The results revealed that patients in the experimental group had spent 600% fewer days in hospital and had contracted 300% fewer AIDS-related illnesses (e.g., ulcer and encephalitis) compared to patients from the control group. These differences between the two groups were significant. In addition, the placebo effect was not considerable as about 55% of the patients in both groups believed that the healers were praying for them, and they didn't feel any better than the other patients.[114]

The results of the two studies conducted by Elisabeth Targ and her colleagues are quite clear. However, this is not the case for all the studies on the therapeutic effects of prayer. Some of them suffer from methodologically significant shortcomings, and other studies produce results that are not as repeatable as lab-based studies. In all likelihood, this is due to the fact that many factors are involved in prayer for the healing of others, and it is difficult to control for all these variables. For example, the ability of participants to generate non-local intent effectively can vary considerably from study to study.

Hence, Dean Radin and his colleagues asked themselves how meditation training can modulate the effects of compassionate distance healing.[115] In their double-blind study (which they called the *Love Study*), they recruited couples. For each couple, one member was in perfect health while the other member was receiving cancer treatment. The healthy partner played the role of the sender, while the patient was the receiver. In the trained group, the senders were invited to develop a compassionate intent, an act of selfless love for another person to relieve their suffering and increase their well-being. The meditation training program consisted of a one-day workshop. For a period of three months, participants chosen to be the senders were required to practice meditation for 30 minutes daily.

In addition to the coaching group, there was a control group on the waiting list. The members of this group were the same couples but tested before the health partners followed the training program. A third group, the

control group, consisted of healthy couples who did not receive training. When a couple arrived at the laboratory, they were both equipped with electrodes to monitor skin conductance, heart rate, and respiration. The two spouses were then asked to maintain a feeling of connection uniting them for the duration of the experiment. In the control group, the couple were asked to determine which of the two spouses was the most receptive – the role of receiver was attributed to this person. In the other two groups (trained and waitlisted), the receivers were still the cancer patients.

The receivers sat in a reclining chair in a room shielded from electromagnetic waves and acoustically isolated. They were informed that they would be seen at random time periods, *via* a video monitor, by the senders who were in another room (the two rooms were separated by a distance of 65 feet). During these periods, the sender had to make a mental effort to connect with the receiver. At other times, the video image disappeared, and the sender had to relax and not send any compassionate thought. The receivers did not know the length of the periods of compassionate intention or relaxation. The intentional periods, in fact, lasted 10 seconds, while the relaxation periods varied from 5 to 45 seconds. This duration was determined randomly by a computer program.

In all, 36 couples participated in the study. The analysis of skin conductance in all senders of the different groups revealed a significant increase after the images of the receivers had appeared on the video monitor. This indicated activation of the sympathetic nervous system resulting from the mental effort associated with compassionate intention and healing thoughts. About two seconds after the video image appeared, the skin conductance of the senders began to increase and then peaked around three seconds later. Radin and his colleagues also compared the skin conductance of the receptors in the three groups. All receivers responded promptly after the sending period started. In the control group, the skin conductance response disappeared after four seconds, whereas this response faded after five seconds in the control group on the waiting list. For the trained group, the skin conductance of the receptors increased gradually for eight seconds. It was in this group that the highest increases were noted. These results suggest that meditation training can increase the effects of compassionate remote healing.[116]

Chapter 5

A Delocalized Consciousness

The day which we fear as our last is but the birthday of eternity.
Seneca

Near-Death Experiences and their Various Elements

What happens after the death of our physical body? Do our minds and personalities survive? What about our consciences? Do they vanish completely into oblivion? If life continues after death, do we continue to exist as an individual entity or rather within a universal Spirit? These deep existential questions have probably haunted human beings since the appearance of *Homo sapiens*.

There are multiple ways to tackle these major questions. One can, for instance, simply accept the teachings on this subject from religions, philosophers or even esoteric traditions. However, it is also possible to consider what science has discovered about death.

Over the last 40 years, several researchers have been studying the long-lasting mental experiences of individuals who are physiologically or psychologically close to death. These have been called “near-death experiences” [NDEs] and individuals who report such experiences are referred to as “experiencers.” NDE can occur as a result of cardiac arrest, an accident, illness, or complications associated with surgery or severe bleeding. These experiences can also occur during or after childbirth as well as following coma, intoxication or electrocution.

Statistical studies indicate that in the Western world about 4% of the population has had an NDE. Other studies reveal that over the last 50 years, more than 25 million people worldwide have experienced an NDE.[117] This is already major, but the development of automatic defibrillators and access to this technology should significantly increase the number of experiencers in

the future.

Apparently, NDEs are not influenced by factors such as gender, race, socioeconomic status, level of education, and belief systems. Thus, NDEs occur as frequently among atheists and agnostics as among religious people.[118]

Even though no two NDEs are identical, and experiencers hardly ever experience all the typical aspects of this experience, research shows that the NDE is characterized by some basic elements.[119] One of the most common elements is the out-of-body experience (OBE), which is the feeling of leaving one's body and seeing events unfold from an outside point of view or a spatially distant place. During OBEs, experiencers realize not only that they retain their mental faculties (e.g., consciousness, perception, thought, memory, personal identity, will, and emotions) but that these faculties are strengthened. Thus, hearing is sharp, vision can be extended to 360° and the mind is alert. Experiencers also frequently state that in the absence of their physical body, they are able to project to wherever they wish (e.g., pass through walls) and read thoughts.

From a scientific viewpoint, OBE is crucial as it is the most objective component of NDE, and the only one that can be corroborated independently. All other components of NDEs are essentially subjective. Feelings of peace and joy and passing through a dark region or dark tunnel that is often followed by the appearance of an unusually bright light are other typical aspects of NDE. On the other hand, it is not uncommon for experiencers to allude to another world of splendid beauty with striking cities and prodigious gardens, and also hear extraordinarily ethereal music. Experiencers also often report meetings with deceased family members or friends, who appear younger and healthier than in their memory.

In addition, experiencers commonly claim to have met a "Being of Light" who can communicate telepathically, and who radiates total acceptance and unconditional love. Some cross-cultural studies indicate that personal religious beliefs and cultural perspectives influence how NDE is interpreted.[120] For example, a Christian might believe that the "Being of Light" encountered was Jesus, while a Buddhist might think that it was Buddha. In the presence of such a being, experiencers sometimes experience a review of life. During this review they can see their entire life unfolding very fast before them, and relive major or minor events in this life, sometimes by adopting the perspective of the other individuals involved. This element of

the NDE allows experiencers to draw conclusions about their lives and the changes they may be subject to.

In the later phase of NDE, experiencers may encounter a barrier, in the form of a wall, bridge or river. There, they understand that they will no longer be able to return to their bodies and resume their lives if they cross this border. The "Being of Light" or departed relatives then explain to experiencers that they must return to their bodies because the objectives of their physical life have yet to be achieved. In general, it is at this point that experiencers are compelled to return to their bodies.[121]

A Life-Altering Experience

Research on the impact of NDE reveals that these experiences positively and significantly transform the majority of experiencers. They share a comparable psychological profile after NDE, regardless of differences in personality prior to this experience: this is reflected in their beliefs and values, their attitudes and behaviors, as well as their visions of the world. These psychological and spiritual changes, which become more apparent over time, do not correspond at all to the kind of changes one would expect if one takes NDE as a simple hallucination.[122]

Let's take a brief look at the various types of changes frequently reported by experiencers. First, when they come back, the way they perceive themselves has changed – they have better self-esteem and more self-confidence, reducing their reliance on the approval of others. They also realize that the main purpose of their existence is to discover and fulfill their mission on Earth. Experiencers marvel at and are filled with gratitude for life, which has more meaning and interest and for which they now feel a sense of deference. As a result, their concerns now extend to all life forms, and they become more sensitive to the health of the biosphere. Moreover, less critical and more tolerant, experiencers also become more altruistic and compassionate, which often leads them to donate to charity or to focus on humanitarian causes. They also spend more time with loved ones and friends, and they consider the quest for power, fame, and material success as pointless and empty.

Experiencers also often note a decline in their religious affiliations, which is accompanied by an increase in their spirituality and a greater interest in contemplative practices such as meditation and retreats. Moreover, irrespective of their previous beliefs, experiencers now have the certainty that

life continues after the death of the physical body and that God (or a transcendent principle) exists. Experiencers also often return from their experience with various psi abilities (for example, clairvoyance, telepathy, and precognition), and they sometimes try to recover knowledge acquired during NDE and lost during "reintegration" into the physical body.[123]

Even though NDEs are powerfully transformative experiences, they not only have positive consequences, as most experiencers come out shaken, struggling to accept and integrate them. This process is even more difficult when their experiences are viewed negatively or skeptically by caregivers, family and friends. It is not unusual for experiencers to feel depressed, lonely and nostalgic during the first years after their experience.[124]

In a small number of cases, reported NDEs are unpleasant or downright scary. They may, for example, be accompanied by anxiety due to the experience of a loss of control during passage through the tunnel or "absolute void." The few studies available on negative NDEs suggest that egocentric people and those who are afraid of dying, who feel anger or guilt, or who believe they will go to hell when they die are more likely to experience a negative NDE.[125]

On this subject, here is an extract from the testimony of an individual reported by my good friend, Dr. Jean-Jacques Charbonier, a French anesthesiologist who has been conducting research on NDE for several years.[126] The negative experience reported took place during heart failure.

> *There were a lot of people around me trying to revive me. I then went into a sort of very dark cone that was spiraling and a very strong current carried me to the end of this funnel. Along the way, I came across wrinkled, grimacing faces that seemed to belong to people who were suffering horribly. The more I sank into that cylinder that was getting narrower, the more the people were suffering. They were screaming but no sound came out of their mouths. It was horrible. I too could feel their suffering [...] When I finally arrived in front of this immense flame, I first thought that I was in hell and that I was going to be burned right away. But the flame started to dance funnily, and it enveloped me, asking me how I had helped others. I did not know what to answer. It was then that I realized that my past life had been a series of petty larcenies and scams.*

However, most negative NDEs also contain positive elements which often make up most of the experience. This type of NDE can also have positive consequences since most experiencers who have had a negative NDE are no longer afraid of dying, and they recover their faith in God. In addition, they interpret their negative experience as an opportunity to change their lives completely.[127]

Confirmed Perceptions during Clinical Death

Fifteen years ago, neurologist Olaf Blanke and his colleagues reported in the scientific journal *Nature* the strange experience undergone by an epileptic woman.[128] Since the patient's seizures could not be treated by medication alone, she was advised to turn to neurosurgery. In order to obtain information on the location and extent of the epileptogenic zone (the area of the brain that causes the seizures) that had to be removed during the operation, the medical researchers implanted electrodes in her right temporal lobe. Other electrodes were implanted to identify and locate, through electrical stimulation, brain regions that, if removed, would cause paralysis or deficiency in sensory or linguistic abilities. Such an approach preserves the integrity of important brain areas that are adjacent to the epileptogenic zone.

When the researchers stimulated the angular gyrus – a brain structure located at around the temporoparietal junction, which seems to be involved in the perception of our body in space, the patient described herself as "floating" near the ceiling. She also claimed to see her legs "shrinking." In another article published a few years later, Blanke and his colleagues described the OBE as the outcome of a temporary dysfunction of the angular gyrus.[129]

This interpretation is not consistent because the experience reported by this epileptic patient represents an illusion involving a false perception of reality. Whereas, in contrast, typical OBEs associated with NDEs often involve verifiable perceptions of events related to resuscitation or accident, as well as surrounding areas. In this regard, some accounts from experiencers have been supported independently by witnesses. One of the most famous cases of veridical perceptions corroborated during NDE – perceptions that we can attest to have coincided with reality – is that reported by cardiologist Pim van Lommel and his colleagues in the Netherlands. In this particular case, the veridical perception was corroborated by a nurse in a cardiology intensive care unit during the pilot phase of a study conducted by van Lommel and his colleagues.[130] Here is the testimony of this nurse:

During a night shift, an ambulance brought a 44-year-old man, cyanotic and in a coma, to the coronary care unit. Passers-by had discovered him an hour earlier in a field. After admission, he was given artificial respiration without intubation, while cardiac massage and defibrillation were performed. When we tried to intubate the patient, we had to remove the denture he had in his mouth. I removed these upper dentures and placed them on the "emergency cart." Meanwhile, the cardiac resuscitation attempt was ongoing. After about an hour and a half, the patient had sufficient heart rate and blood pressure, but he was still comatose, intubated and on a ventilator. He was transferred to the intensive care unit so that artificial respiration could continue. It was only after more than a week that I met the patient again, who was back at the cardiology division. While I was handing him his medicine, he called out to me:

"Oh, this nurse knows where my dentures are."

I was stunned. Then he explained to me:

"Yes, you were there when I was brought to the hospital and you took my dentures and placed it on the cart with all the bottles and sliding drawer underneath where you put it."

I was amazed because I seem to recall that scene unfolding while this man was in a coma and in the process of being resuscitated. I asked him to tell me more. The man told me that he had seen himself levitating over the bed, with the entire medical team busy around his body. He was also able to describe correctly and in detail the small room where he had been revived as well as the people who were with me. While observing the scene, he was fearful that we would cease the resuscitation protocol and let him die. And we did have a very negative prognosis for this patient considering his condition when he arrived. The patient also told me that he had tried desperately, but in vain, to make us all aware that he was still alive and that we should continue the resuscitation. He had been deeply affected by his experience and said he was no longer afraid of death. Four weeks later, he left the hospital in perfect health.

Another interesting case of confirmed perception has been reported by the English cardiologist Richard Mansfield, who revealed the following to Dr. Sam Parnia.[131] During his night shift, Mansfield was urgently called to attend

to a cardiac arrest. Along with the other members of the medical team, he rushed to the patient, a 32-year-old man who had no pulse, was not breathing and whose electrocardiogram (ECG) had flatlined. Dr. Mansfield and his colleagues then attempted to resurrect this man, although the chances of saving him seemed very slim. The patient was intubated and administered oxygen, adrenaline and a cardiac massage. Despite this intervention, the ECG remained flat and the pulse absent. Members of the medical team continued their efforts for over half an hour, unsuccessfully, then Mansfield told them to stop everything: it was terrible, but they had to accept the fact that the young man had died. Just before ceasing cardiopulmonary resuscitation maneuvers, Richard Mansfield looked at the monitor, the electrodes, and the wires attached to the electrodes to make sure everything worked perfectly.

Mansfield left the room and went to the nurses' station to write notes in the medical file of the patient who had just died. While carrying out his task, Dr. Mansfield realized that he did not remember exactly how many adrenaline vials had been administered to the deceased patient. About 15 minutes later, he returned to the room to check this detail.

In the bedroom, Mansfield looked at the young man and found that his lips and skin were no longer as bluish as when the resuscitation maneuvers had ceased. Suspecting that something was wrong, Richard Mansfield approached the patient to see if he could feel a pulse in his groin. Stunned, the cardiologist discovered that the patient did have a pulse. The other members of the medical team were called on the spot and the cardiopulmonary resuscitation maneuvers were resumed. This time they were successful. Once the patient was stable, he was transferred to a room located in the intensive care unit.

About a week later, Mansfield visited the patient. To the cardiologist's amazement, not only had the young man fully recovered, but he had also suffered no brain damage. The patient then told the cardiologist that he had witnessed everything that Mansfield had done (check his pulse, stop the resuscitation maneuvers and leave the room, return later and once more check his pulse, and then restart the resuscitation maneuvers).

Richard Mansfield confided to Sam Parnia that he was confused by this case because it was a medical impossibility.[132]

Such cases are of great importance because during cardiac arrest, the flow of blood into the brain is interrupted and breathing stops. When this happens, the electrical activity of the brain (as measured by the EEG) disappears after

10 to 20 seconds, and the cardiac arrest victim is then considered to be in a state of clinical death.[133] In such circumstances, Dr. Jean-Jacques Charbonier proposes the use of the term “Provisional Death” since the cardiac arrest victim is no longer in “a state of imminent death”: in fact, the patient has sometimes been clinically dead for several minutes.[134]

Because brain regions mediating mental functions are no longer functional, cardiac arrest victims are not expected to have clear conscious experiences that they could recall. However, studies conducted in the Netherlands,[135] Belgium,[136] the UK[137] and in the United States[138] have revealed that about 15% of cardiac arrest survivors recount memories of the time they were clinically dead. These studies, which evidenced more than a hundred NDEs, demonstrate that consciousness, perceptions, thoughts and emotions can be experienced during a period when brain activity is no longer detected by an EEG.

Proponents of materialistic theories of the mind argue that even if the EEG pattern is flat following cardiac arrest, there may be residual brain activity in the deep structures of the brain, which would not be detected because of the limitations of this neuroelectric activity recording technique. This argument is valid since the surface EEG – measured using electrodes applied on the scalp – primarily records the activity of cortical neural populations.[139] However, brain activity recognized by neuroscientists as the necessary condition for conscious activity and mental functions – perfectly measured by the surface EEG – is clearly absent during cardiac arrest.[140]

Biological Explanation Attempts That Fail

Materialist scientists have proposed biological explanations to explain the different aspects of NDEs. In my view, these attempts at explanation all fail to account for the richness and multidimensionality of these experiences, as well as their implications.

One of these hypotheses proposed by psychologist Susan Blackmore is that of the “dying brain”[141]: A lack of oxygen (or anoxia) during the death process could produce abnormal excitement of neurons in the brain areas associated with vision, and such abnormal excitement would result in the illusion of seeing a bright light at the end of a dark tunnel. However, this hypothesis contains several flaws. First, tunnel observations are absent from several stories of experiencers. Secondly, if anoxia played an important role in the production of NDE, most individuals experiencing cardiac arrest

should report an NDE, but this is not at all the case.[142] On the other hand, when their oxygen levels drop significantly, people with poorly functioning hearts or lungs experience an "acutely confusing state," which they remember little or nothing of, and in which they are very agitated and confused. The contrast is striking with those NDEs experienced with lucid awareness, clear reasoning, and well-structured thought processes. Experiencers also remember the NDE precisely, completely, and permanently. Had Blackmore's hypothesis been correct, the illusion of seeing a tunnel and a light should be stronger as the level of oxygen in the blood drops. However, individuals with low oxygen levels do not witness a tunnel or light, or other typical aspects of NDEs, and in some cases, some people experience NDEs even though they are not on their deathbed and oxygen levels in their brain are normal.[143]

Another research field indicates that the anoxia hypothesis is not valid. It has to do with the work done during the 1990s by Dr. James Whinnery of West Texas A&M. He conducted studies simulating the extreme conditions that occur during air combat maneuvers. During these studies, Whinnery subjected fighter pilots to significant gravitational forces in a giant centrifuge. Rapid acceleration significantly reduced blood flow and the delivery of oxygen to the brain. This caused the pilots to have short periods of unconsciousness, which Whinnery called "*dreamlets*." The main characteristics of these *dreamlets* were confusion, impaired memory for events just before the loss of consciousness, and disorientation upon waking. These symptoms do not typically accompany NDEs, and no psychospiritual transformation has been reported following dreamlets.[144]

It has also been suggested that NDEs do not occur during the time of brain damage but just before or after, while the brain is more or less functional.[145] The weakness of this interpretation lies in the fact that the state of unconsciousness induced by the stopping of the heart leaves amnesic individuals confused as to the events that took place immediately before or after the cardiac arrest.[146] In addition, the confusion accompanying the loss or regaining of consciousness does not transform life at all, unlike NDE. On the other hand, in some cases, these experiences contain time markers that take the form of truthful reports of events that occurred at the precise moment of brain damage.[147]

Other researchers have speculated that hypercarbia, an increased level of carbon dioxide in the blood, could be involved in NDEs. However, the

different aspects of NDEs are rarely present in hypercarbia, and these experiences can occur while the level of carbon dioxide in the blood remains normal.

If anoxia and hypercarbia cannot be held responsible for NDEs, could these experiences be hallucinations that simply result from chemical imbalance in the brain?

It is well known that the ingestion of ketamine, an anesthetic agent that is sometimes used recreationally, can generate hallucinations. In small doses, ketamine can also lead to OBEs. This drug works primarily by blocking N-methyl-D-aspartic acid (NMDA) receptors. These receptors open normally in response to binding with glutamate, the most abundant excitatory chemical messenger in the human brain. Psychiatrist Karl Jansen hypothesized that inhibition of NMDA receptors could lead to an NDE.[148] However, experiences with ketamine produce strange images and are often frightening. Moreover, most ketamine users know that the experiences produced with this drug are illusory. In contrast, experiencers are absolutely convinced that they have experienced something real. In addition, most of the central elements of NDEs are not reported by ketamine users.

Some have speculated that temporal lobe epilepsy may induce all the typical aspects of NDEs.[149] However, an exhaustive review of the medical literature related to this neurological problem reveals that the main characteristics of the NDE do not accompany epileptic seizures located in the temporal lobes. In fact, the symptoms associated with this type of seizure include hallucinations, mental confusion, and negative emotional states.[150] And even though neuroscientist Michael Persinger has claimed that he can produce NDE using transcranial magnetic stimulation of the temporal lobes,[151] the experiences reported by study participants have little in common with the characteristics of NDEs.

Experiences on the Threshold of Death

Experiences on the threshold of death are another phenomenon that suggests that life does not cease when the physical body stops functioning. Most medical staff who work in palliative care are familiar with these experiences. These are manifested in the days, hours, and even minutes that precede death. These experiences have been reported since time immemorial among various cultures.[152]

During threshold of death experiences, experiencers are in a state of

expanded consciousness – as if the veil separating life from death was being raised – and they see loved ones who have previously died or spiritual beings unknown to them. Sometimes dying people reach out to these "characters" of their visions, whom they perceive as messengers coming to assist them in their transition to the afterlife. At times dying people speak directly to these characters, or they report to the doctors and nurses caring for them what these characters tell them.[153] In some cases, dying people hear wonderful music or they describe places of great beauty belonging to another world. Similarly, just before dying, the great inventor Thomas Edison said: "It's very beautiful here." And Steve Jobs, founder and CEO of Apple, exclaimed: "Oh wow! Oh wow! Oh wow!"

These experiences reduce the physical and emotional distress of the dying, and bring them comfort, peace, and serenity. At the end of life, approximately 90% of individuals are in coma stages too deep to communicate. However, of the 10% who remain conscious before their death, more than half of them report such experiences.[154]

Many doctors believe that threshold of death experiences are just hallucinations due to drugs or wishful thinking. This can sometimes be true. However, there are cases where the hallucination hypothesis is invalid because the dying person surprisingly recognizes a person who he thought was alive but who had actually died recently. Dr. Bruce Greyson, psychiatrist and researcher at the University of Virginia, compiled many of these cases in a study published in 2010.[155] In this regard, Greyson wrote: "Cases like this provide some of the most convincing evidence about the survival of consciousness after the death of the physical body."

Here are some of these cases:

In a car accident, a woman sees her father who died an hour earlier

An indigenous woman is dying after a car accident when a stranger stops to offer his help: she tells him: "If you go near the reserve, please tell my mother that I am fine. Not only fine, but also very happy because I'm already with my father." The stranger finds her mother and gives her the message. The mother tells him that about an hour before the accident, her daughter's father died of a heart attack.

A boy sees his mother's first love

On his deathbed, a 7-year-old boy with leukemia tells his mother that he went to heaven. The boy also tells her that he has met a man who has introduced himself as his mother's first love. Following a car accident, this man became disabled. The mother is convinced that she never spoke to her son about this former boyfriend. She later discovers that this man died the day her son had the vision.

Shared Death Experiences

Dr. Raymond Moody is the American physician who drew the attention of the general public to NDEs in the mid-1970s. His subsequent research led him to discover a related phenomenon, the shared death experience (or SDE – Dr. Jean-Jacques Charbonier uses the term "death perceptions" to refer to it[156]). This phenomenon is documented in his book *Glimpses of Eternity: Sharing a Loved One's Passage From This Life to the Next*.[157] Moody spoke with hundreds of people who experienced a SDE. This experience is reported by a healthy individual who has an emotional connection with another individual experiencing the transition from life to death of his physical body. A SDE seems to rest on an empathic sharing of the experience of the dying person.

Based on his own work, Moody offers the model narrative of such an experience in this book:

> *A woman named Jane is sitting with her husband, who is terminally ill with cancer, after thirty years together. He has lost consciousness and, according to the doctor who is treating him, his death is imminent. [...] As she looks at him, a white haze rises and vanishes in the air above him. [...] Suddenly, a white light with dancing particles envelops the room, Jane, who feels a bit dizzy, realizes that she has left her body and is floating near the ceiling of the room. She looks down at herself, sitting near the corpse of her husband, which feels odd as she can sense him not far from her. She turns her head and sees him smiling at her [...]. The couple continues to levitate with scenes from their lives unfolding around them. They travel through their past and witness these sometimes-panoramic fragments unfurling; [...]. Amongst these are scenes where Jane is not present, scenes from her husband's life. [...] Together, they*

> *move to a corner of the room that is no longer at right angles. The whole room's shape has changed shape and seems to keep on changing [...]. This may be due to this opening, this tube that seems to expand near the ceiling, like a door leading to another world. Jane and her husband go in [...] [and] find themselves in an Edenic landscape. There is nothing but splendor around them. [...] Jane and her husband take a path that leads down to a stream. As they get closer, Jane realizes that she cannot go further. [...] She is happy for her husband who is not in pain and who does not inhabit his mortal body anymore. She takes leave of him and, in a flash, finds herself in her own body, sitting next to her husband's motionless corpse [...].*

The work of Raymond Moody indicates that several elements characterize SDEs:

Perception of spiritual entities entering the room. Experiencers see these apparitions, which seem to be the deceased loved ones of the dying, entering the room at the time of death.

Vision of the spiritual essence of the dying leaving the physical body. In some cases, experiencers report a mist (whitish or greyish) which emanates from the dead body and is sometimes a transparent replica of the person who has just died.

Perception of a brilliant and mystical Light. This supernatural Light, which illuminates the room, is perceived by the experiencers as being a source of purity, love, peace, and comfort.

Participation in the life review of the deceased. Experiencers can see scenes of the deceased person's life. These scenes sometimes form a hologram that surrounds the bed of the deceased individual.

Impression of change in the structure of the room. Experiencers sometimes report that when the other person dies, they seem to penetrate into another plane of reality that does not conform to the rules of three-dimensional geometry. For example, the cubic hospital room seems "to change" into something else; it can take the appearance of a funnel, and experiencers may have the impression of being outside their physical body and perceive the room from an angle that cannot be described with common words.

Discovery of an unreal and Edenic landscape. The experiencer discovers

a landscape where all is splendid. They can also hear ethereal music so sublime that it is impossible to describe with words.

Accompanying the deceased to the Light. Some experiencers claim to have left their physical body at the moment where the individual they were accompanying died and reinstated their "bodily envelope" as the deceased entered the Light.

Like NDEs, SDEs can have a profound impact on those who live through these experiences, soothing the pain of death and reinforcing the belief in life after death. Furthermore, experiencers note an increase in their empathy, and they review their priorities leading them to make changes in their lifestyle. Feeling that they have suddenly matured and that their lives are gaining in depth, experiencers also begin to reflect on philosophical problems, and they no longer act impulsively. After their SDE, they also become more aware of their consciousness and of the importance of love for the other and the search for knowledge. Finally, experiencers often produce a calming effect on people.

As noted by Dr. Jean-Jacques Charbonier,[158] SDE cannot be secondary to phenomena of hallucinatory effects of anoxia or various cerebral disorders since the individuals who experience these are of sound body and mind.

Can Light Have a Healing Power?

In late August 2014, Germaine Challut, who was then 79 years old, had severe abdominal pain. A few years earlier, she had been given an artificial anus because of rectal cancer. She was taken to the emergency room at the hospital. There, she was told that she was suffering from peritonitis with rupture of the intestine. The situation was dramatic because the stools had spread to her abdomen, and her body had become infected. Many of her organs were affected. As her condition deteriorated very quickly, a doctor decided to induce Germaine in an artificial coma, with the agreement of her daughter Isabelle, nurse and birth companion.

When the doctor decided to stop the artificial coma, Germaine did not wake up. After a week, Isabelle decided to "unplug" her mother's medical assistance because previous discussions with her revealed that Germaine was not in favor of being kept alive on a life support system. Her family came to the hospital to say goodbye. A priest was also present.

The next morning, to her amazement, Isabelle Challut found her mother sitting in bed, full of life and famished! Germaine told her daughter that she

went through a tunnel moving towards the Light. She was no longer suffering pain, had no more fever, and a CT scan indicated that her abdominal infection had partially resorbed. Germaine agreed to take intravenous antibiotics for a week, and she was allowed to return home.

Her personality seemed also to have changed because while she had previously been usually an anxious woman, Germaine was now very calm and did not care about her physical condition. Back home, she gulped down broth and spent time connecting with the Light she had contacted during her NDE. Six weeks after Germaine's "return to life," her infection had completely disappeared, and she was doing very well.[159]

The case of Germaine Challut is not unique because other seemingly "miraculous" healings have been documented following an NDE. One of the most famous cases is Anita Moorjani, an Indian living in Hong Kong. In 2006, this woman, with stage IV lymphoma, became comatose and had an NDE. Following this experience, her cancer completely vanished. As with Germaine, this is completely inexplicable from a medical point of view. Obviously, such cases suggest that experiencers contacted a higher power that infinitely transcended the physical world and the domain of the living during their experiences.

Chapter 6

The Ultimate Mystery

The beauty of death is presence, the inexpressible presence of beloved souls, smiling at the tears in our eyes.
Victor Hugo

Communicating with the Deceased

In the previous chapter, we learned that the scientific study of NDEs indicates that consciousness is not annihilated in the first minutes after death. However, NDEs usually last only a few minutes. They give us no clue as to what happens in the hours, days, months or years following the death of our beloved ones. This central question represents the ultimate mystery for many human beings. To come up with an answer to this vital question, it would be necessary to communicate with the deceased. But is that possible?

This key issue has tormented visionary and open-minded researchers for ages. In this respect, almost a century before NDE studies began, Frederic Myers, Frank Podmore, and Edmund Gurney – three pioneers of psychic research who had contributed to the creation of the *Society for Psychical Research* – gathered, in the 1880s, several thousand testimonies to study after-death communications (or ADC) empirically.[160] ADC occurs when the deceased spontaneously manifest themselves to one of their relatives by a visual, olfactory, auditory or tactile sign, without any help or external solicitation from a medium or any other intermediary. Sensing or feeling the presence of a deceased person is also part of ADC. Often, during these experiences, deceased loved ones give assurance to the mourners that they are now living happily in another plane of existence.

ADCs are a fairly widespread phenomenon, since studies in some Western countries have revealed that about 30% of the individuals polled claimed to have had contact with a deceased.[161] These experiences make the

grief of the bereaved more bearable and provide solace. ADCs also alter the beliefs of the bereaved about the meaning of life and death, and help them to cope with loss and mourning.

We cannot naively and simplistically assume, as do the pseudo-skeptics,[162] that all ADCs are only illusions or hallucinations because they are sometimes associated with objective phenomena, such as the movement or breaking of objects, and sounds that can be recorded. At times, a deceased person's apparition produces a shadow or is reflected in a mirror. Moreover, in some cases, more than one person may perceive the presence of the deceased, and in other cases, the deceased communicate new information to the bereaved which they can later check.

The case of James Chaffin's will is an obvious example. Arthur Berger, a lawyer from Miami, investigated this case in 1995.[163] Chaffin was a farmer from North Carolina who died in 1921. Sixteen years earlier, he drew up a will by which he bequeathed his farm to his eldest son, and nothing to his wife and to his other three sons. In 1919, James Chaffin decided to draw up another will. He placed it between the pages of a Bible and did not breathe a word of it to anyone. When the farmer died, his first will was the one to be validated. One night, after his death, one of his sons who had been left out of the will saw him at the foot of his bed. The apparition revealed to him that the new will was in the pocket of his old coat. After this appearance, the son found the coat and a note in his father's handwriting, sewn inside the pocket. Chaffin had indicated, on the note, the Bible reference where his son would find the latest will. The document was taken to James Chaffin's attorney. Although he found the story quite incredible, he could not question its veracity and the second will was validated.

Here are some recent ADCs listed by the After-Death Communication Research Foundation (ADCRF), an organization founded by Dr. Jeffrey Long, a doctor internationally known for his research on NDEs, and his wife Jody Long:

> *Suddenly I woke up seated on the right side of the bed and saw my brother sitting on the wooden panel that served as a footboard (a head and a footboard). He looked just like I remembered him – dressed in jeans, and a leather jacket, with his black and wavy hair shining and his big black eyes sparkling. I do not remember being surprised at all; what*

was happening was normal. At the same time, I saw my husband sleeping on my left, as well as cardboard boxes containing clothes not yet put away, and also our disassembled wardrobe. My younger brother then spoke to me. He explained that he was not really gone, that he was doing very well, that he was happy and that I had to stop crying so much.
– Babette B.[164]

One night, I was asleep, and I know that this was no dream. I felt something, someone close against me and squeezing me tightly. I realized at that moment that it was him, it was his way of holding me at night, he was there against me. I remember taking his hand; I really felt it and squeezing it tight against my chest. I felt his breath on my neck and his distinctive smell. He was there, I'm certain. Since that moment, I feel much better even if I am still grieving and sometimes burst into tears; but he had come to reassure me. I know he is well. Since then, I have the impression that he is always there with me and that he accompanies me and protects me day and night. I still feel him at night next to me. He is not dead; he is alive, in another form.
– Marie M.[165]

Induced Post-Mortem Communication

ADCs seem to occur spontaneously, at least from the perspective of the bereaved. But an American psychologist, Allan Botkin, claims to have developed a therapeutic technique that allows the bereaved to intentionally come into contact with their deceased relatives.[166]

In the 1970s and 1980s, Botkin tried to treat war veterans suffering from post-traumatic stress disorder (PTSD) by using so-called "confrontational" therapy. This classic therapy, prevalent at the time, consists in repeatedly confronting the patient with his memories of traumatic experiences in order to gradually weaken his emotional reactions. Botkin became frustrated by the inefficiency of this approach, which can take years to yield results. In 1990, he discovered EMDR (Eye Movement Desensitization and Reprocessing), another psychotherapeutic technique for the treatment of psychological trauma. Botkin realized that with EMDR, he obtained better results faster as he could see important changes sometimes within the first session.

During an EMDR session, the patient is asked to clear her mind and focus on a negative thought or image related to a distressing event. The patient must simultaneously follow the therapist's fingers which move laterally into the patient's field of vision for 20 or 30 seconds. The patient is then asked to focus on a positive belief, previously described at the beginning of the session, and to focus her attention once more on the painful memory. After several cycles of rapid eye movements, the patient's positive belief is anchored, and her emotional distress vanishes.

Five years after becoming familiar with EMDR, Botkin met a patient named Sam. He fought in Vietnam where he befriended Le, a young orphan whom he had promised to himself he would adopt and bring back home with him. One day, while Sam and other US Soldiers were helping a group of orphans, including Le, to get on a truck to take them to an orphanage, they were bombed. Sam then discovered Le's body lying in the mud. He was absolutely crushed until he met Allan Botkin. During his EMDR session, Sam saw Le, who had now grown into a gorgeous woman with long black hair. He also felt her arms around him. Le thanked him for taking care of her before she died. Sam was jubilant, convinced that he had had genuine contact with Le. As for Botkin, he remained skeptical and believed that Sam had confused reality with the imaginary. Nevertheless, many patients react in a similar fashion to Sam, and these "contacts" seem to be soothing and reassuring, and also lead to a better acceptance of death. Botkin decided to follow this lead.[167]

His first Induced After-Death Communication (IADC) session was with Gary, whose daughter Julie died at the age of 11. Julie's mental competence never surpassed that of a 6-month-old baby, due to a severe oxygen deficiency at birth. After a heart attack, Julie died in Gary's arms. Although not a believer, Gary agreed to try Botkin's new method. In this method, the therapist asks the patient to focus on grief. After the eye movement, and once the feeling of grief has lessened, the therapist asks the patient to keep her eyes closed. This allows the patient to enter a state of receptivity conducive to receiving any information that may come from the deceased.

When he opened his eyes at the end of the session, Gary was utterly dumbfounded. He then told Botkin: "I saw my daughter! She was playing happily in a garden filled with vibrant and sparkling colors. She seemed perfectly healthy, without the physical problems she had experienced during her life. She looked at me and I sensed her love." Julie also told Gary that she

would always be with him. When he emerged from the session, he was ecstatic as he felt that he had reconnected with his daughter. A year later, he told Allan Botkin that he still felt in touch with Julie. His IADC session showed him that "people do not really die, they just change state and inhabit a different environment, an exquisite environment."[168]

Allan Botkin has conducted several thousand IADC sessions. The results are impressive because the method works in 70% of cases, with people of all faiths, including atheists and skeptics. In the state of consciousness induced by this technique, the patient receives information in the form of visions and voices heard telepathically, and he may also feel physical contact. The deceased are often full of love for the living, whom they reassure and encourage to console themselves. In some cases, the deceased tell the living that they are forgiven for certain things or they ask for forgiveness for actions on Earth that they now regret. In addition, sometimes the deceased communicates new information to the patient (for example, a warning about a future situation like a health issue[169]).

Although Botkin refuses to speculate on the true nature of the communications induced by his method, in order to leave the patient free to interpret his experiences without being influenced by the therapist's beliefs, he, however, denies the objections that the IADC are hallucinations: "The questionable proof is that the consultants describe them as completely different from any other experience. Technically, hallucinatory perceptions are independent of sensory perceptions, that is, they are all in the subject's head, unrelated to external reality. Hallucinations often involve very different negative emotions from one person to another and are related to important psychological disorders. While the IADC most often involves positive content, similar from one person to another, they are very beneficial psychologically."[170]

According to Dr. Olivier Chambon – a French psychiatrist and psychotherapist who uses the Botkin method – this approach is revolutionary because it radically changes the way we think about mourning therapy, which it greatly fast-tracks. Like Allan Botkin, Dr. Chambon does not think that IADCs can be reduced to hallucinations, defense mechanisms or unconscious desires because sometimes the messages of the dead can be the opposite of what patients expect. Olivier Chambon also claims that contemporary specialists in grief therapy now recognize that the old recommendations to forget the deceased – like not having internal conversations and not keeping

things belonging to them – "were unsuitable and potentially harmful. On the contrary, it is necessary to maintain the relationship which has finally changed level: this relationship has become more subtle, but the bonds of love can grow deeper." Thanks to the Botkin method, "the relationship is maintained, it is not over, it is just of a different nature; it remains dynamic, interactive, and people realize that their deceased have not suffered." The relationship with death of those who consult is automatically altered: "When they contact the deceased, patients know they will find them. They are less afraid of death and of their own death."[171]

When Science Takes an Interest in Psychics

Psychics are known to be able to communicate with the deceased and receive information about living conditions in the afterlife. As for clairvoyance, it refers to all faculties specific to psychics.

During the second half of the nineteenth century, clairvoyance became very popular and pioneers of psychic research – such as William James, Edmund Gurney, Frederic Myers and Charles Richet – saw it as an important phenomenon which psychology had to focus on. For these researchers – who did not believe that mediumship could be explained simply by chance, suggestion, hallucination or fraud – it was imperative to empirically study the possibility that psychics could deliver authentic messages from deceased individuals without going through normal sensory channels; because these researchers firmly believed that this type of study could potentially demonstrate the survival of consciousness and personality after death.

The investigations of the so-called mediums during this period revealed numerous frauds, and the practice of mediumship quickly lost its credibility. In particular, the illusionist Harry Houdini (whose real name was Ehrich Weisz), who was fascinated by the question of survival after death, was one of those who led a fierce hunt for charlatans and impostors of all kinds: fake mediums. The unmasking of these impostors, who used conjuring, made sure that the majority of scientists of the time decided to distance themselves from the study of mediumship.

It was not until nearly a century later that serious scientists dared to study this phenomenon rigorously and systematically. Two of these scientists were Julie Beischel, co-founder of the Windbridge Research Center,[172] and my colleague and friend Gary Schwartz, director of the Laboratory for Advances in Consciousness and Health at the University of Arizona.

When a medium first encounters a client he does not know, that medium may be able to provide the client with a certain amount of factual information that he claims to have from deceased persons. The essential question that arises at this time is obviously: “Where does this information come from?” While doing a postdoctoral fellowship in Gary Schwartz’s lab, Julie Beischel focused on this issue. Working with her research director, Beischel developed a rigorously controlled protocol which would make it possible to verify the nature of the information that can be received by mediums when “conventional” opportunities to obtain this information are eliminated.[173]

There are various “conventional” ways to get information about someone you do not know. First there is fraud or deceit: a person who is not a medium can carry out searches beforehand (for example, on the Internet) on the client, or the deceased, to come up with accurate information. The protocol developed by Beischel and Schwartz eliminates this possibility since the medium has only the first name of the deceased person throughout the duration of the experiment. Another conventional explanation is “cold reading.” This expression refers to a set of psychological techniques used by fake mediums to analyze the visual or auditory cues that they get from clients. These techniques allow fake mediums to develop a correct and complete reading simply by observing the client’s reactions to the information presented to them. In the experiments conducted by Julie Beischel, the person who plays the role of the client (the subject) is not physically present in the same room as the medium. In addition, the person conducting the experiment (the experimenter) does not know anything about the subject and has no information about the deceased. Hence, the experimenter cannot transmit subtle or unconscious signals to the medium. Finally, another possible conventional explanation is that statements made by the medium are so general that they could apply to almost anybody. To eliminate this last possibility, in Beischel and Schwartz’s protocol, the experimenter asks the medium to answer four specific questions about the deceased person: physical description, personality, hobbies or activities, and manner of death.

In experiments conducted by Beischel, each medium was conducting a reading about two dead people with only their names as information. During the reading, the experimenter asked them the four specific questions on each deceased. The readings were done over the phone, and the experimenter was unaware of anything except the first names of the deceased. The medium and

the experimenter were not in the same city, and often not even in the same state. When both readings were completed, they were then transcribed. Then, any reference to a name was removed from these documents, which were then given to read to people whose relative was one of the two deceased, without them knowing which of the two readings corresponded to them. These people had to evaluate the concordance of each of the readings with the deceased by rating them. This approach eliminated the possibility of evaluator subjectivity.

The many experiments carried out by Julie Beischel and Gary Schwartz indicate that mediums can receive unexplained accurate and precise information on dead people they do not know anything about. How is this possible? Beischel and Schwartz have proposed that two hypotheses can account for their results: either mediums actually communicate with the deceased, or mediums can "read" the minds of clients who come to consult them through clairvoyance or telepathy. The second hypothesis implies that mediums would obtain information without really communicating with the deceased. However, given that the information provided by the medium was sometimes unknown to the person who was undergoing the experience as a client, but the veracity of which was later confirmed, Beischel and Schwartz therefore believe that their results support the idea of the survival of consciousness. According to them, an aspect of our personality would continue to exist after physical death in a form capable of communicating with a medium.[174]

Instrumental Transcommunication

The expression "Instrumental Transcommunication" (or ITC) was originally put forward by the German physicist Ernst Senkowski. Now deceased, he had long been a professor in electrical engineering at Polytechnic School of Rheinland-Pfalz. ITC refers to a means of communication with the "invisible world" that relies on the use of technology (for example, radio or television), for receiving messages, rather than on a medium. This approach, which has grown more polished in recent decades, therefore complements mediumship. Similarly, ITC is used to bring solace to individuals who are experiencing psychological distress, following the loss of a loved one. Another objective of ITC is to validate the existence of life after death.

In its current version, ITC is usually either audio or video. Audio ITC usually consists of an audio recording in which a background noise is added

to help the deceased alter it. With respect to video ITC, “static” on a television screen is filmed with a camera, and then the recording is analyzed to detect images that seem “out-of-the-ordinary.”[175]

The idea of using technology to be able to communicate with the dead is far from new. In the 1870s, American inventor and industrialist Thomas Edison – who filed more than a thousand patents over the course of his long career, and to whom we owe several inventions, including the alkaline battery, the light bulb, and the phonograph – wanted to offer the proof of the survival of personality thanks to technical advances. Edison was convinced that it would be possible to develop a “necrophone,” a device capable of receiving voices from the afterlife. Thomas Edison was not the only one to think so because most pioneers of radio and television – such as Oliver Lodge, William Crookes, John Logie Baird, Édouard Branly and Guglielmo Marconi – believed that it was only a matter of time before technological development could enable communication with the dead.[176]

Edison’s necrophone project failed. But important developments, related to the audio ITC, occurred a few decades after the death of the famous inventor. Thus, in the early 1950s, two Italian Catholic priests, Father Ernetti and Father Gemelli, worked together on a research project on music. Ernetti was an internationally recognized physicist, while Gemelli, who was a medical doctor and psychologist, was president of the Pontifical Academy of Sciences. In 1952, when Ernetti and Gemelli were trying to record a Gregorian chant, one of the tape’s wires was constantly breaking. Exasperated, Father Gemelli looked towards the sky and asked his dead father for help. Shortly after, the two men, stunned, heard the voice of Gemelli’s father, recorded on the tape. The voice said: “Of course I’ll help you. I’m always with you.” Gemelli and Ernetti decided to repeat the experiment. This time, a very clear and humorous voice said: “But, Zucchini, [...] do you not know it’s me?” Father Gemelli looked at the tape on the recorder. Nobody was aware of the nickname his father used to tease him with when he was still a boy. Gemelli thought at that moment that it was his father who was speaking to him through the tape recorder.[177] Later, the two priests visited Pope Pius XII in order to share their experience with him. Although Pius XII was not surprised beyond measure by what Fathers Gemelli and Ernetti reported to him, it was decided, at the Vatican, that the matter should not be spread any further.

A few years later, in 1959, Swede painter and filmmaker Friedrich

Jürgenson also realized, fortuitously, that the voices of the deceased could be recorded. Jürgenson's accidental discovery occurred when he decided to record on tape bird songs around Stockholm for the soundtrack of one of his films. Back home, while listening to the recording, Jürgenson thought he heard, overlapping the songs of birds, a weak voice calling out to him. He assumed that it was radio interference, but there was no transmitter at the place where the recording had been made. Intrigued, Jürgenson continued to experiment at home and he managed to pick up other voices and short messages from his mother or deceased friends.[178] Friedrich Jürgenson was so impressed that he spent the rest of his life recording voices.

After his meeting with Jürgenson, who had published a book about the many messages he had received, Konstantin Raudive – a Latvian psychologist and literary man teaching psychology at Uppsala University – took over from the Swedish filmmaker. In the years that followed, Raudive made more than 70,000 recordings using the static noise of a radio.[179] In 1971, sound engineers working for Pye Records, a famous British music record label, invited Konstantin Raudive to participate in a controlled experiment. Raudive agreed and the experiment was carried out in an acoustically insulated room that blocked radio waves. During the experiment, Raudive was not allowed to touch the tape recorder: he was only allowed to speak into a microphone. The recording lasted 18 minutes, and the sound engineers heard no sound other than Raudive's voice. Once the recording was completed, the engineers rolled back the tape to listen to it. They were astonished as they could distinguish more than 200 different voices.[180]

The large-scale works of Konstantin Raudive allowed him to determine four characteristics of electronic voices: different rhythm from ordinary language, extreme brevity of the message (usually a single word or a very short sentence), non-respect of syntax and sometimes a mixture of different languages.

Marcello Bacci was another researcher who was very successful in the electronic voice phenomena field. For nearly sixty years, Bacci has volunteered his ITC method to serve mourners. This man, who did not take advantage of this service and did not seek any advertising, used an old tube radio – which was tuned to white noise in the shortwave band – to help mourners get in touch with deceased people who are dear to them. To complete his ITC experiments successfully, Bacci used the Direct Radio Voice Method (DRV) – he tried to obtain communications directly through

the radio. The results were spectacular as voices often addressed listeners by name and answered their questions by providing many relevant details. Over time, several journalists and scientists have participated in these experiments, and have apparently been able to converse with the deceased, without any fraud being apparent.[181]

Sarah Estep, another pioneer of electronic voice phenomenon, founded in 1982 the American Association of Electronic Voice Phenomenon.[182] Inspired by the approach publicized by Jürgenson then Raudive, Estep has received several thousand messages with only a tape recorder. She separated all these messages into three categories: 1) *Class C:* this is the category that most messages belong to. Often difficult to interpret, they are low whispers and can only be heard with headphones; 2) *Class B:* these messages are stronger and sharper, and they can be heard frequently without headphones; 3) *Class A:* these messages are strong and distinct, and they do not require headphones. Concerning the afterlife, a summary of the information present in the clearest messages received by Sarah Estep follows:

- Family relationships can continue, if desired. Hence, instructors enlighten those who want to communicate with the Earth. However, the frequent calls of those left behind on Earth make the dead weary.
- In the hereafter, the dead lead active and productive lives, and they can continue the same activities as on Earth (sciences, arts, etc.). Their job is best suited to their aptitudes and personality.
- The deceased have the opportunity to visit several places, in the afterlife, before choosing one of them. They live in houses.
- Doctors and nurses help those who need it.
- Some of the dead continue to worship God and may belong to a "church."[183]

In the mid-1980s, some ITC researchers began to receive pictures of deceased individuals on television screens. German Klaus Schreiber, who worked with Professor Ernst Senkowski, was the first of these researchers. His technique was to direct a video camera towards a television and route the signal from the camera to the TV to create an "optoelectronic" feedback loop. The result was a kind of "static" on the TV screen, from where the faces of the deceased or images of places presumed in the afterlife slowly emerged. Using this method, Klaus Schreiber clearly recorded the faces of his two dead wives,

that of his daughter Karin, as well as those of physicist Albert Einstein and movie star Romy Schneider. In 1988, hardly a few years after starting his ITC video experiment, Schreiber died of a heart attack. Apparently, a few months later, Klaus Schreiber started to send, to his old friends and colleagues whom he left behind on Earth, pictures of himself and the house he seemed to inhabit with other deceased members of the Schreiber family.[184]

Klaus Schreiber is not the only ITC researcher to appear to his colleagues who are still (physically) alive. Indeed, Friedrich Jürgenson, Konstantin Raudive, and other deceased pioneers have come into contact with ITC researchers quite often through different means. For instance, American Mark Macy, who contributed to the establishment of the International Network for Instrumental Transcommunication,[185] claimed to have received no less than seven telephone calls from Konstantin Raudive (who passed away in 1974). The conversation, during one of these calls, lasted almost 15 minutes. During another communication, *via* a radio, Raudive revealed to Macy and other colleagues that since his death, he has continued to work actively on the development of ITC systems from the other side. He also tells them the following: ITC works only if the “vibrations” of those attending the sessions are in perfect harmony and their intentions are pure.[186]

Gary Schwartz, my colleague at the University of Arizona, mentioned in the previous section, has been researching mediumship for many years. His research has led him to believe that although some psychics can sometimes be very precise, they are not infallible. As a result, he initiated the development of a communication system with the “invisible world” that would be less likely to be influenced by human subjectivity. In this context, a few years ago, this researcher in psychology tested in laboratory the possibility of using an ultramodern silicon photomultiplier to detect and record low levels of photons potentially associated with the presence of deceased individuals. Schwartz carried out a few proof of concept experiments. These experiments were divided into blocks of five minutes, during which the deceased were invited to manifest themselves in a dark room. These blocks were compared to control blocks of the same duration during which the experimenter (Schwartz himself) did not issue any invitation. Other blocks served to measure the impact of the intention of the experimenter. During all the blocks, the photomultiplier counted the number of photons detected in the dark room. The results showed that the sum of photons detected, when the deceased were invited, was significantly higher

than in the other two types of blocks. These results suggest that a silicon photomultiplier can be sensitive enough to develop another type of ITC system.[187]

For pseudo-skeptics, the voices and images obtained in ITC can only be hoaxes, or aberrant interpretations of natural phenomena such as, for example, artifacts related to the technological equipment used. Such irrational interpretations could also result from apophenia – an alteration of perception, which leads an individual to attribute a particular meaning to what is really only statistical noise – or pareidolia, a kind of optical illusion which consists of associating a formless and ambiguous visual stimulus with a clear and identifiable element. This can happen when the voices or images obtained are not distinct at all. But what about when the voices or images received are clear and unequivocal? In these cases, it is the interpretations of pseudo-skeptics that miss the mark. On the other hand, as noted by Dr. Jean-Jacques Charbonier,[188] several electroacoustic experts have meticulously analyzed the voices recorded in the laboratory using the most sophisticated means. These experts accept that the phenomenon of electronic voices cannot be explained given the current state of scientific knowledge. The analysis conducted by these experts determined that the voices perceived in ITC can exceed 1400 hertz. Such frequencies cannot be reached with human vocal cords, which produce voices between 80 hertz for the lowest frequencies and 400 Hz for the highest frequencies.[189]

In my opinion, the most plausible and respectful explanation of the ITC principle of Occam's razor[190] is that the consciousness and personality of the deceased continue after the death of the physical body. This does not mean that the images obtained in ITC are exact replicas of deceased individuals or buildings in any plane of existence. I think rather that the voices and the images received are the product of a transduction of information,[191] which is carried by the energy associated with the mental activity of the deceased. If this is correct, the recorded voices or images would be the last relay in this informational transduction process. In the last chapter of this book, I will come back to this process and the subject of energy associated with the activity of the psyche.

Chapter 7

Past Lives or Fantasy?

Even chance meetings are the result of karma... Things in life are fated by our previous lives.
Haruki Murakami

Jürgen Keil is a psychologist researching reincarnation – the process of survival after death whereby an immaterial and individual principle (for instance, the "soul") would complete one life passage after the other in different physical bodies. In 1997, he studied the case of a 6-year-old Turkish boy named Kemal Atasoy who claimed he had excellent recollection of a previous life. Kemal lived in a comfortable house located in an upper middle-class neighborhood with his well-educated parents. Since he was two, he claimed to have lived in Istanbul, 800 km from the family home. According to Kemal, in that past life, his family name was Karakas, and he had been a wealthy Armenian Christian living in a large three-story house by the waterside. There were moored boats and a church behind the residence, which was located next to that of a woman named "Aysegul." Karakas only lived there for part of the year. He often carried a large leather bag, and his wife had a Greek name.

Kemal's parents were neither acquainted with any Armenian nor anyone in Istanbul. And they were skeptical about Kemal's statements. Despite this, Jürgen Keil decided to verify whether the child's claims could be confirmed.

With his interpreter, Keil went to Istanbul. There, he found Aysegul's house, with an empty three-story residence near it, perfectly matching Kemal's description. This residence was found near the water, and there were indeed moored boats and a church behind. Jürgen Keil also spoke with an old man in the neighborhood, who told him that an Armenian had actually lived in this residence. The following year, Keil returned to Istanbul and met with a well-respected local historian. The historian confirmed that a wealthy

Armenian Christian had lived in that house. His last name was “Karakas.” He was a merchant and often carried a large leather bag. In addition, his wife was Greek Orthodox, and they lived in the house only during summer. He died in the early 1940s.

How could Kemal Atasoy, who lived in a small town 800 km from Istanbul, know so much about the life of a man who had died fifty years before his birth? For this little boy, the explanation was simply that he had been Karakas in a past life.[192]

Research on Reincarnation

Through the ages, many peoples such as the Ancient Greeks, the West Africans, and many Northwestern Amerindians in North America, as well as followers of religions like the Hindus, Buddhists and some Christian groups have maintained their belief in reincarnation. This belief is still present as surveys have revealed that nearly 25% of Americans and Europeans believe in reincarnation.

Dr. Ian Stevenson, a psychiatrist who was for a time Director of the Department of Psychiatry at the University of Virginia, spearheaded research in this sector. Stevenson began his work during the 1960s. In the course of his career as a researcher, he focused on cases from India, Sri Lanka, Thailand, Myanmar (Burma), Lebanon, Turkey, Nigeria, Brazil, and the United States. During the following decades, other researchers – such as Erlendur Haraldsson, psychologist at the University of Iceland, and Jim B. Tucker, psychiatrist at the University of Virginia – started to do research on reincarnation.

In 1967, Dr. Stevenson founded the Division of Perceptual Studies at the University of Virginia. Jim Tucker is now the head of this research group. During the last fifty years, members of this group have identified more than 2,500 cases of children claiming to remember events that took place in previous lives.

Researchers in this area find cases more easily in countries where belief in reincarnation is widespread. They find such cases mainly through newspaper articles and by word of mouth. Researchers usually travel to the site once the child has given enough details about the past life to allow his current family to contact his previous family.

The investigation begins with an interview with the child’s current family. The parents first provide information to the researchers about the

child's statements and behavior. The researchers then verify the similarities between the child's assertions and the life of the deceased individual (the previous person). When a child has a birthmark that appears to match a wound on the body of the deceased, the researchers try to determine the degree of similarity with the help of the autopsy report – whether it is a lethal injury, or the medical record.

Children's claims are the main subject of the cases examined by researchers. Children make assertions when they are very young. Most children make these claims when they are between two and four years old and usually stop talking about their previous life around the time they turn six or seven. Many of these children exhibit behaviors and emotions that seem to be associated with memories of the past lives that they report. For example, sometimes children cry and beg their parents to take them to their former family. In addition, many children develop phobias that seem directly connected to the way the previous person died. Furthermore, some children are constantly replaying the scene of the previous person's death, and when that person has been murdered, they may feel a lot of anger towards the murderers. In other respects, certain children prefer the favorite foods of the previous person, even tobacco or alcohol. As well, oftentimes when the child's family is driving them to where the previous person lived, they seem to recognize members of the deceased person's family as well as places related to their previous life. On the other hand, several individuals who were subject to studies by Stevenson and Tucker were born with birthmarks or congenital anomalies matching the usually fatal injuries on the previous person's body.[193]

In some cases, children claim to have remained close to the body of the previous person and the family, and to have attended the funeral. Thus, at two, Ratana Wongsombat, who was born in Bangkok in 1964, told her father that she had been a Chinese woman, named Kim Lan, in her past life. Ratana also told her father that Kim Lan's ashes had been scattered under the Bodhi tree of the temple, instead of being buried as she had wished. Kim Lan's daughter, Mae Chan, confirmed Ratana Wongsombat's statement, explaining that when she had tried to honor her mother's wish, the tree's roots had been so abundant that she ended up scattering her mother's ashes instead of burying them.

In other cases, children report experiences during the interval between death and reincarnation. For example, a boy named Lee recalled that he had

decided to be reborn at some point. He also claimed to have been assisted by other beings in his decision to reincarnate on Earth. Similarly, Patrick Christenson, a little boy who had three birth defects matching those of his late brother Kevin, reported talking with a relative named “Billy the Pirate” in “Heaven” who told him that he had been shot and died in the mountains. Patrick’s mother said she had never heard of a family member with that name, but when she called her own mother to inquire, she discovered that a cousin who bore the nickname “Billy the Pirate” actually died that way.[194]

Birthmarks and Congenital Anomalies

Patrick Christenson, whom we just discussed, was born in Michigan in 1991. When the hospital nurses brought him to his mother, she immediately felt that he was connected to her first son Kevin. The latter had died of cancer at the age of 2, twelve years previously. Patrick’s mother noticed that Patrick had three congenital anomalies that matched three marks on Kevin’s body who began to hobble at 18 months old. One day he fell and broke his left leg. The doctors then gave him a checkup that included a biopsy of a nodule on the scalp, above his right ear. A bone scan revealed a cancer accompanied by numerous metastases. In addition, his left eye was bulging and bruised due to a tumor.

Kevin underwent chemotherapy, with a catheter inserted into a vein on the right side of his neck. After this treatment, he was able to go home. However, five months later, Kevin was hospitalized again. By then, he was almost blind in the left eye. He was treated with antibiotics because he had a fever. He died two days later, three weeks after his second birthday.

Shortly before his death, his parents separated. After that, Kevin’s mother remarried, and she gave birth to a little girl and a little boy. Then she gave birth to Patrick. Patrick had a sloping birth spot, akin to a small cut, at the exact spot where the catheter had been inserted under Kevin’s skin. In addition, Patrick had a nodule on his scalp, exactly where Kevin had his. Patrick also had a cataract in his left eye, causing almost complete blindness in that eye. This problem was due to corneal leukemia.

At about four and a half, Patrick started to make statements that seemed to be related to Kevin’s life. For instance, he told his mother that he wanted to go back to their old house, and that he had left her there. He also claimed that this house was orange and brown, which was correct. Patrick asked his mother if she remembered the operation he had undergone. When she told

him that he had not had one, he showed her the place above his right ear where Kevin had a nodule biopsy. Another time, Patrick saw one of Kevin's photographs, which were not usually displayed in the family home, and said it was a photo of him.

Patrick's mother learned about the research conducted by Ian Stevenson and Jim Tucker, and contacted them. The two researchers visited the family when Patrick was five years old. They obtained Kevin's medical records, as well as copies of Patrick's eye exams. Stevenson and Tucker noticed the opacity in Patrick's left eye. They also photographed the birthmark on his neck. The spot consisted of a dark, sloping 4-millimeter line on the lower right side of Patrick's neck and looked like a cut which had healed. The nodule on his head was difficult to see, but easily palpable.

The story of Patrick Christenson is one of the cases of birthmarks and congenital anomalies described by Ian Stevenson in his book *Reincarnation and Biology*.[195]

In another book, *Children Who Have Lived Before: Reincarnation Today*, German writer Trutz Hardo tells the story of a three-year-old boy from the Golan Heights region, near the border between Syria and Israel. It was Dr. Eli Lasch who was instrumental in the development of Gaza's medical system, who brought this fascinating story to Hardo's attention. The boy in question belonged to the Druze ethnic group. This religious community believes in the reincarnation of souls. The boy was born with a long red birthmark on his head. When he was old enough to talk, he told his family that he had died from a blow to the head, administered by a man with an axe. Since he knew the village from where he came, his parents took him there.

The boy also remembered the name of the previous person. A villager told the family that this person had disappeared four years earlier. The child then revealed his murderer's full name, and he also managed to find his former house. While walking with his family, the boy recognized the said murderer and called him by his name. Then he confronted this man saying: "I was your neighbor. We fought, and you killed me with an axe." All the blood drained from the man's face, but he did not confess to the crime. The boy then told the village elders where the body of the previous person was buried. At this exact same spot, they found the skeleton, which revealed a head injury consistent with the boy's birthmark. They also found the axe. Faced with this evidence, the murderer admitted to committing the crime.[196]

Another Fascinating Case

Another spectacular case reported by Ian Stevenson is that of Sujith Jayaratne. This little boy was from Colombo, the capital of Sri Lanka, and he started to display a distinct fear of trucks when he was merely eight months old. As soon as he was able to speak, he said he had lived in Gorakana, a village 10 km from Colombo, and had died after being hit by a truck. Sujith made many statements about this previous life. His great-uncle, who was a monk in a temple not far from this village, heard some of Sujith's affirmations and shared them with another monk who was captivated by this story. He met Sujith, who was then a little over two and a half years old, to discuss his memories. During his conversations with Sujith, the monk took notes, intending to verify the child's assertions later on. According to these notes, Sujith told the monk that he was from Gorakana, and that he had lived in the Gorakawatte neighborhood. His father's name was Jamis and he experienced problems with his right eye. Sujith also claimed that he had attended a dilapidated school and had had a teacher named Francis. The child also claimed to have given money to a woman named Kusuma, who sometimes made him rice noodles. Furthermore, he stated that his house had been whitewashed, that the toilets were located next to a fence, and that he bathed with fresh water. Sujith also said that he gave money to the temple in the forest, and added that there were two monks there, one of whom was called Amitha.

Sujith gave his mother and grandmother more details about this previous life. He told them that his name was Sammy and that he was sometimes called "Gorakana Sammy." His wife's name was Maggie and their daughter Nandanie. As for Kusuma, she was his little sister's daughter. She had long thick hair, and also lived in Gorakana. Sujith added that he had worked for the railways, and had climbed Adam's Peak, a high mountain in the center of Sri Lanka. He had also transported *arrack*, an alcoholic drink whose trade was prohibited. One day his boat capsized, and he lost all his cargo. The day he died, he had had an argument with Maggie, who had stepped out of the house. He had then decided to head to a shop. As he was crossing a street, he was hit by a truck and died.

The monk who had taken notes about his conversations with Sujith went to Gorakana to try to find a family in which there was a deceased member whose life matched his claims. After a while, the monk discovered that a 50-year-old man named Sammy Fernando – and who was sometimes called

“Gorakana Sammy” – had died after being hit by a truck. This had taken place six months before Sujith’s birth. All of the child’s claims turned out to be true, except that he did not die immediately after being hit by the truck. Indeed, Sammy Fernando had died a few hours after being taken to the hospital. Later, Sujith successfully identified several individuals, part of Sammy Fernando’s family circle, as well as changes made to his home.

During his investigation, conducted one year after the identification of the previous person, Ian Stevenson spoke with 35 people, including Sujith, who was still talking about this past life at three and a half. Stevenson identified two residents, from Sujith’s neighborhood, who had been linked to Sammy Fernando. One of them had been his drinking companion, and the other was his little sister.

In addition to his truck phobia, Sujith had other behaviors that seemed to correspond to Sammy Fernando’s life. For instance, he pretended to drink arrack and role-played as a drunk. He also tried to get this liquor from neighbors and smoke cigarettes. In Sujith’s family, no one drank arrack nor smoked cigarettes. On the other hand, Sammy Fernando had obviously overindulged in this liquor and in cigarettes. Sujith also demanded spicy foods that Sammy loved and consumed regularly – foods which Sujith’s family rarely ate and who would not have thought of giving to a child. Moreover, Sujith had a tendency to swear and to be physically aggressive, which was also the case of Sammy Fernando when he was drunk.[197]

Reincarnation: Criticisms and Assumptions

In his book *Life Before Life*, researcher Jim Tucker analyzes various objections and possible explanations about reincarnation. One of the objections is the following materialist argument: we should not even consider the possibility of reincarnation because we do not know anything about the mechanisms that can explain it. Therefore, we do not know how consciousness could survive without a physical body, or how it could influence a developing fetus. We need only look at the history of medicine to see the weakness of this argument: indeed, doctors have begun to use some treatments well before their underlying mechanisms were discovered.

Another common objection is that population growth makes reincarnation impossible. In other words, given that today’s population is much larger than in the past, all the individuals currently living on planet Earth could not have reincarnated many times in the past. However, some people who are alive

now may have had previous lives, while it would be the first for others. New beings could also be created. Another possibility is that some may be reborn because they have things to learn or settle, while others may choose not to be reborn.

In dementia such as Alzheimer's disease, the cerebral degeneration that accompanies this syndrome is associated with memory loss and personality changes. For materialist scientists, this indicates that an intact brain is needed for awareness and that, therefore, memories and personality traits cannot survive death. As Jim Tucker aptly points out, this does not mean that the brain is the source of consciousness, memories, and personality. In fact, instead of producing them, the brain could only allow their manifestation.

When children's claims are not very precise, imagination and coincidence could be the explanation. However, research shows that children providing details about past lives are not more likely to fabricate lies than other kids.[198] Moreover, when the investigated children mention very specific details, or exhibit behaviors (for example, phobias) or birthmarks, the reincarnation hypothesis becomes the most plausible.

There still isn't any theory to lead to an understanding of all the aspects related to reincarnation. However, the most restrained hypothesis to explain researchers' discoveries in this area is that mind and consciousness are not confined to the brain; they would exist before our birth and would continue after our death. In addition, mind and consciousness could attach successively to various physical vehicles (bodies), and lead to memories, emotions, and even traumas in some cases. Hence, the child would identify himself with the previous person because they had been one in the past; memories, behaviors, tastes and preferences, attachments and dependencies, and even physical injuries would be transmitted by the consciousness that survived death to the being having started a new life.

Some prefer the super-psi hypothesis to explain the discoveries of researchers in the field of reincarnation. According to this hypothesis, the children studied by these researchers can gain knowledge of all that is possible to know through extrasensory perceptions. However, it does not explain birthmarks, nor why these children have such a strong conviction of having been someone else. Furthermore, the super-psi hypothesis is hardly reconcilable with the fact that, in general, these children do not manifest any particular psi abilities.[199]

Hypnosis and Past Lives

Hypnotherapists, who are searching for the source of their patients' problems, investigate their past with the help of age regression. This approach aims at identifying old events that are the source of the problems (for example, particular phobias, dependencies, psychosomatic symptoms) experienced by patients. Sometimes the patients' subconscious produces images and evokes emotional reactions that seem to refer to events that do not belong to the current life of these patients. Therapists using hypnosis obviously cannot determine with certainty whether the contents that emerge from the consciousness of patients constitute a symbolic expression of the *psyche* (like a dream or daydream) or represent episodes related to one or previous lives. Indeed, it is not possible to distinguish between what comes from real memory or the abilities of the mind to reconstruct our autobiographical memory – the memory of the events lived with their context – and the mental capacity to generate false memories and purely imaginary contents. That is why many psychotherapists are wary of hypnosis. Be that as it may, regression hypnosis often leads to the resolution of patients' problems quickly and effectively. Moreover, in some cases, the exploration of past lives makes it possible to find specific details and go back to characters with a historical reality. The hypnotherapist Tatjana Radovanovic Küchler reports such a case:

> *Annabelle was simply interested in experiencing regression in a previous life. In a state of relaxation, she saw herself as a married woman waiting for her husband's return in the 1940s. But while waiting, an officer came to announce the much-dreaded death of her husband, aboard a submarine or boat accident apparently.*
>
> *After the session, Annabelle researched the family name she had in the previous life and the date of the accident, which led to a person who actually lived in Canada in the 1940s and whose description matched what she had seen in her regression. This disturbing experience served to convince her that she was truly an eternal soul. She also became certain that her brother, to whom she is very close, was none other than her husband who had died accidentally in the previous life.*[200]

This case, and others like it, are not conclusive evidence of reincarnation. However, as I will show in the next section, spiritual hypnosis is another source of evidence supporting the Reincarnationist Hypothesis.

On the other hand, with hypnosis, Dr. David Cheek, an obstetrician, helped individuals retrieve intrauterine memories that were subsequently confirmed. One of these people, a little girl, remembered that her mother was wearing a dark green plaid dress and had said: “It has to be a girl!” The girl’s mother confirmed this information. Cheek believes that the fetal experience depends in part on extrasensory perceptions of the mother and her environment throughout pregnancy. The work of this doctor goes against the idea that babies, at the time of birth or even before, can store information in their memory.[201]

Similarly, Wendy Anne McCarty, a pioneer in prenatal and perinatal psychology, suggests that the baby’s abilities to develop self-awareness and a sense of identity involve not only brain development, but also a transcendental self that is not produced by the physical world. This transcendental self is nonlocal and would ensure that the reincarnating entity already possesses a sense of identity. This self would also perceive the baby’s body as a vehicle, which he would use during the incarnation. The human ego, for its part, would be anchored in neurobiological processes. The combination of the two selves would constitute an integrated ego.[202]

Life Between Lives

Michael Newton was one of the pioneers of spiritual hypnosis.[203] In the late 1940s, this clinical psychologist began to use hypnosis to help his patients solve the problems that led them to him. His patients often ended up in what appeared to be past lives. Having received a scientific education and being an atheist, Michael Newton did not believe in previous lives, which he conceived as imaginary constructions of the subconscious, and he was not willing to accompany his patients in these said past lives. However, he discovered that he got positive clinical results when his patients understood the links between their problems and events that occurred during the supposed past lives.

One day, during a hypnosis session, one of the patients told Newton that she thought she was in a place and a moment between two of her earthly incarnations. Soon, other patients reported similar experiences. Some patients related what happened at the time of their death, others talked about what

they experienced when they found their “soul family,” or preparations for a new incarnation on Earth. Michael Newton was intrigued, and he decided to systematically regress all the patients coming to consult him to this life between lives. To do this, he induced his patients into a state of appropriate supra-consciousness, which helped to unlock the memories linked to the spiritual dimension, and used a questionnaire.[204]

Michael Newton thus became a “*spiritual regression therapist*,” a hypnotherapist specialized in life after death. With the protocol he developed, he collected data from thousands of patients for more than 40 years. This would allow him to draw a picture of what happens on the “other side” between two incarnations. The data he collected shows that patient testimonials are consistent regardless of whether they are atheist, religious, or agnostic. For Newton, these testimonies suggested that it was more useful for his patients to rediscover the state of life between lives than their previous lives because in this space-time, they could reconnect with their deepest essence, their soul, as well as their wisdom and all the information that related to them.

Through the data he collected over several decades, Michael Newton was finally convinced of having traced the different stages of the journey of “souls” in the afterlife. This journey begins with physical death and ends with reincarnation when returning to Earth. I present here a summary of what Newton discovered about the various stages of this journey.[205]

At the moment of death, the soul of the person who has just died realizes that it is floating around its physical body. It feels relaxed and curious, rather than fearful – free, happy, and euphoric. It is sometimes frustrated when it realizes that it cannot communicate with the living, who seem to ignore it. Some souls choose to stay close to their bodies, after their physical death, until their funeral as they wish to comfort the loved ones before continuing their journey. They are not upset because they know they will see their loved ones in the hereafter, as well as in future lives.

The soul of the deceased person sees a light of dazzling whiteness far away, behind a dark area which is pulling the soul towards it. This dark area, which constitutes the door of the beyond, looks like a tunnel. The perception of musical vibrations can accompany the crossing of this tunnel. This music heightens the feelings of well-being and calmness experienced by the soul. At the end of the tunnel, the soul of the deceased finds loved ones (soulmates, relatives, friends, spiritual guides) full of love who welcome it to a

spectacular place. It then realizes that it has left behind a heavy and cumbersome physical body, and that it must now accept its new state.

At that moment, the soul of the person who has died feels like it is coming back home. The reunion with its spiritual guides and its soulmates who had already left Earth, and with whom it had the most affinities, make it very happy. The guides and soulmates, who are waiting for us near the doorway into the afterlife, are there to reassure the newly arrived soul and help them adapt to its new state. They can manifest themselves as a mass of energy. They can also adopt human traits and choose to appear in an aspect identical to the one they had in past lives with the soul back in the spiritual world. As the soul is androgynous, they can appear in a feminine or masculine form, according to their preference.

The reunion is followed by a transition stage during which the soul receives a “healing bath” to recover from the diseases and traumas of the earthly life it has just left, as well as the trauma of leaving relatives and this life. During the next stage, that of orientation, the soul is invited by one of its guides to assess the life it has just completed. All memories are then accessible, and the soul analyzes everything it has done according to a program it had chosen before incarnating.

As a result, the soul will join its group of souls, which is in fact its real family. The groups of souls (from 3 to 25) are composed of entities of roughly the same spiritual level, who do not leave each other. There are also meetings of primary groups, usually with more than 1,000 souls. All these souls participate in moments of exchange or sharing.

Spiritual guides are actively involved in the realization of our destiny. They remain close to us during our many incarnations, to help us follow our life plan. There are guides of different levels. The quality of the guide that is assigned to the soul is determined by the level of the soul. There is one guide per group. Some very advanced guides work with groups of souls found on both the Earth and the spiritual world. These advanced guides are assisted by beginner guides.

After assessing its past experiences and getting enough resources in the afterlife – since physical lives can sometimes be quite grueling – it is now time for the soul to choose a new life. This choice, which is made in collaboration with the spiritual guides and the group of souls, is made according to what the soul can learn from the point of view of its evolution. Three questions arise for the soul to prepare for this new life: 1) Am I really

ready to face a new physical life? 2) What lessons do I need to learn to increase my knowledge and evolve? 3) What environment and identity would allow me, in my next life, to work as hard as possible to achieve my goals? The soul's project is submitted to a council group consisting of evolved entities in the place of selection of lives. The members of this council, whose role is not to judge but rather to help, provide information to souls who want to be reincarnated to help them work on negative behaviors in the next incarnation. The place selected for the next physical life is like a movie theatre: souls can see scenes of their potential future lives unfold there. But it is not possible for them to see and know everything. This makes souls come back to Earth, or incarnate on another planet, with a kind of global map, or life plan, based on what they have chosen.

The choice of body is also of major importance. Michael Newton's patients reported that this choice is influenced in part by karma, the principle of causality according to which all our thoughts, words and actions are causes, and all our experiences their effects. Newton's patients also revealed that selecting difficult lives and far from perfect physical bodies (for example, with disabilities) allow faster progress on the spiritual level. Another important aspect of choosing a new incarnation is the selection of the psychological traits of the character in which the soul chooses to incarnate. These traits must allow the soul to reach its life goals.

The choice of parents and family is obviously another essential part of the new life. Some people find it extremely difficult to accept this idea because they are convinced that they are innocent victims who have had the misfortune of being the offspring of bad parents. However, as souls possess free will, they are never victims without the qualities and tools to overcome hardships and fully realize their life programs.

The soul that wishes to incarnate must also "synchronize" with other loved ones – for example, siblings, friends and spouses – who will participate in its life scenario. This synchronization is mutual insofar as this soul plays a significant role in the lives of all those close to it by allowing them to realize their own life plans. In this context, it is imperative for the soul that incarnates to be able to recognize the members of its group of souls with whom it must interact in its future life. It thus goes to the place of recognition where signs are encoded in its memory. These signs, which are associated with the five senses (for example, a particular way of laughing at a person or a piece of jewelry worn by another person), will create memories that will

allow the recognition of these members to key moments in the life of the incarnated soul. As for meetings with a soulmate, who will eventually become a male or female companion, an intense moment full of “magic” allows recognition.

When the soul is finally ready to reincarnate on Earth (or elsewhere), it greets its friends and is escorted by its spiritual guides into a boarding lounge for the return journey. It then takes a tunnel and comes to merge with the body of a child in pregnancy, in the mother’s womb. Some souls come to inhabit the body of the embryo very soon after conception but usually they reach the host to which they are assigned during the fourth or fifth month of pregnancy. In the fetal state, they become accustomed to their host’s brain while remaining conscious of being immortal souls. After birth, amnesia sets in and souls combine their immortal characters with the temporary human spirit of the host. It is this combination of traits that creates a new personality.[206]

Chapter 8

Journeys to the Source

The total number of minds in the universe is one... In truth, there is only one mind.
Erwin Schrödinger

Other Transformative Experiences

Like Near-Death Experiences (NDEs) and the phenomena discussed in previous chapters, spiritual experiences (SEs) represent another category of manifestations that contradict the materialistic scientific ideology. SEs are usually experienced in an expanded state of consciousness. During a SE, the experiencer accesses a "larger" reality, which transcends the material world, and can also come into contact with nonphysical entities.

SEs are more common than we think. For example, a survey conducted in 2004 by the National Opinion Research Center (NORC) found that 50% of Americans had an SE that had greatly impacted their lives.[207] These experiences often take place during prayer or meditation, or while contemplating nature. SE can also accompany physical or mental health problems, including depression[208] and those who experience them can change dramatically. Thus, following intense SEs, perception of the world widens, and life acquires a new meaning; beliefs, values, attitudes, behaviors, and the sense of identity (the sense of self) are transformed. Kindness, compassion, unconditional love, and helping others become important. Experiencers realize that they are spiritual beings continuing to exist beyond the physical plane. They have a deeper sense of interconnectedness with Nature – the existence of a transcendent principle (which many call "God") becomes a reality, which helps experiencers to face problems with greater serenity. Experiencers usually acquire a whole new perspective on their problems, and they no longer feel victims of day-to-day hardships. At times, SEs lead to

physical or emotional healing.[209]

Here is the story of a remarkable SE that a man living in the United States shared with me:

> *During an evening in 1977, I was in my car, ready to go home when suddenly, faster than a thought can become a thought, I found myself in a world of Angels without any trace of material reality [...]. I found myself facing a Glorious Guardian Angel, enveloped in a white robe of Light. I was also wearing a similar robe. We looked into each other's eyes and stared at eternity. I realized, at that moment, that this world was eternal, as well as this angel, myself and all conscious beings. The Guardian Angel disappeared, and suddenly, all my incarnations flashed up on a cosmic screen. I then understood the material life illusion that imprisons us. I cannot say that I emerged from this experience a changed man because, in truth, I did not come back at all except for some fragments of an old life. I severed all ties with everyone I knew and with the life I led. I no longer lived as I did before this experience, when I was only concerned with myself. After my experience, I cared about everyone because I knew from now on that my essence was the same as everyone else [...]. I feel that my brain was transformed during this experience because since then, my mind is always in the present – neither in the past nor in the future.*
> *– Vincent R.*

There are different types of SEs. One of these is the mystical experience (ME). MEs are at the root of most major religions. These experiences, which allow the experiencer to become aware of cosmic realities that cannot be grasped during regular states of consciousness, have thus greatly influenced the history of humanity. MEs have the following characteristics: loss of sense of self; outside time and space; impression of having reached the ultimate foundation of reality; feelings of peace, happiness and joy. ME, which cannot be expressed in conventional language, is also a source of non-rational and intuitive knowledge.[210]

During certain MEs, there is a temporary union, even an identity, with the

ultimate Reality, which is identified in different forms (the One, the All, the Absolute, the Ground of Being, the Source, the Universal self, God, Brahman, Tao, Allah, etc.). Individuation then disappears and is replaced by the perception of being one with all things in the universe. The experiencer enters at that moment into a state which is called in certain traditions (for example, the Advaita Vedānta) "non-duality." This state is accompanied by the intuition that the Ground of Being is at the origin of all existence and that it expresses itself through an infinity of distinct forms. Psychiatrist Richard Maurice Bucke coined the term "cosmic consciousness" to refer to this subtype of ME.[211]

Through virtually all great spiritual traditions and eras, historical figures have reached the state of cosmic consciousness, either temporarily or permanently. However, what is remarkable is that the experience of cosmic consciousness can also happen suddenly to individuals who until then had shown no interest in spiritual things.[212] The following account illustrates this possibility. It was sent to me by a woman named Sheila:

> *As I was a firm atheist, I paid little to no attention to everything that seemed even remotely related to religion. But my skepticism to religion could not prevent my spiritual awakening [...]. On February 14, 1997, my perception of the world suddenly changed dramatically. Abruptly and without warning, an element of my consciousness, my soul, escaped from the confines of my body and rose above the bed on which my body was resting. Shortly after, the material plane around me seemed to disintegrate into a sea of particles and then in a foggy ether. Then I crossed a sort of threshold separating the material world from the metaphysical world to float in an oceanic universe [...]. I noticed then that my breathing was in tune with a breathing sound echoing through the universe. This cosmic breathing seemed to come from the ether around me and seeped into my body found in the room. It is at that moment that I became extremely attentive to the presence of a living and conscious entity that permeated the entire cosmos. Following this discovery, my sense of self faded to contain this cosmic Consciousness [...]. During this unitive experience with God (the Creator), the veil that obscured my thought rose [...] until my soul hastily left the metaphysical plane in order to reintegrate my body [...]. Discovering the spiritual*

dimensions of my human condition for the first time was like putting on a new pair of glasses. My perspective changed abruptly [...]. I morphed into a new creature: a mystical one. I now saw the world through different eyes. My thoughts changed radically [...]. My sense of identity was no longer bound to the content of my mental activity. I did not define myself in terms of my culture, my gender, my beliefs and the color of my skin anymore [...]. I now perceived myself as a spark of Cosmic Consciousness incarnated in a member of the human species.

It is conceivable that some individuals in search of the Absolute – and having spent a large part of their lives praying, meditating, and contemplating – could reach the state of cosmic consciousness, during humanity's great adventure. But that people who have no interest in the spiritual can also reach such a state is much more difficult to understand and explain. In these cases, which seem rather rare, it is possible that the experience of cosmic consciousness is given by the spiritual essence of the experiencer – the deepest part of his being – in order to transform his life and guide him towards the realization of his highest potential as a human. It would be part of the evolutionary process of consciousness.

The Rise of Kundalini

Another type of ME is associated with kundalini, a yoga Sanskrit term for a powerful energy curled up at the base of the spine at the level of the sacrum. Represented as a self-winding serpent, kundalini is referred to as "cosmic energy," "creative energy," or "divine energy," according to the various traditions that use this concept. Only a small part of this energy would flow into the body of most individuals. For some yoga schools of thought, the purpose of different spiritual practices (e.g., meditation, breathing, postures) would be to awaken that energy. Once awake, the kundalini would be felt as ascending along the spine, crossing and activating, one after another, the energy centers (or "chakras") of the human body. When this energy reaches the top of the skull at the level of the fontanel, it would follow a state of expansion of consciousness leading to the impression of "one" with the All.[213]

The concept of kundalini is not only found in Hinduism, since it appears under other names in Buddhism, Taoism, and the Kabbalistic tradition. Some

Christian theologians have also drawn a parallel between kundalini and the Holy Spirit.

The “rise” of kundalini is frequently accompanied by perceptual manifestations (for example: flashes of light, buzzing sounds, sensations of heat, tingling, and vibrations). Feelings of fulfillment and bliss often accompany the awakening of this energy, which can be felt as a process of inner purification. However, the awakening of kundalini can reactivate deep fears and former traumas. Moreover, if the intensity of the awakening of this energy is too great, the symptoms can become unpleasant and the experience of the kundalini can lead to psychological disturbances.[214]

Here is the summary of a kundalini experience that I myself experienced a few years ago:

> *I was showering at around 11:45 a.m. During the shower, I felt a boiling sensation in my solar plexus accompanied by nausea. I got out of the shower. I had the strange feeling of losing my identity (being a neuroscientist, I told myself that these symptoms could be related to a tumor). Curiously enough, I was not worried. I was in an altered state of consciousness (as if I were drugged). Mechanically, I got dressed and went to bed at around noon. Powerful waves of energy then surged through my body, from the solar plexus to the heart and to the head. My heart was beating rapidly; I was panting. Again, I wondered if what was happening to me was pathological or dangerous. I heard a voice telling me: Don’t be scared. There is no danger. Let yourself go.*
>
> *I then managed to abandon myself completely. The waves of energy became ecstatic and enveloped me with absolute and unconditional love. Eyes closed, I perceived a golden white light shining and loving. I rested in this Light. I merged with the Light and my identity disappeared [...]. I realized that I could jump into the Absolute and surrender to the Source of all things, that everything was perfect, that you must never worry about anything. During this fusion with the Light, I perceived that all that I needed in order to fulfill my mission of life would be provided to me, that I would be constantly guided. I would receive the necessary information for achieving my future projects [...]. At the heart of the experience, I still perceived my body, but I felt at the same time very far from the Earth. I*

could have died physically and that would not have bothered me at all. Gradually, the force of energy waves decreased, and the rhythm of my breathing stabilized. Gently, I felt myself reintegrating my body. I opened my eyes and then looked at my watch: it was 12:30.

Shamanic Experiences and Entheogens

Shamanism refers to the millennial practices and rituals that are still present in several cultures (for instance, in Siberia, Mongolia, Nepal, Africa, Australia, and among Native North and Latin Americans). In shamanic cultures, initiates or "shamans" resort to various techniques that alter their state of consciousness. These techniques – which include fasting, sweat lodge, drumming, rhythmic hyperventilation, meditative approach, and taking entheogens (psychotropic substances inducing an expanded state of consciousness used for spiritual or shamanic purposes) – mix music, dances, and songs. The trance states thus induced are supposed to allow shamans to come into contact with the dead, the deities, or the spirits of nature (animals and plants). This form of contact would enable shamans to experience mystical states of consciousness, or access information that gives them the ability to heal diseases or predict the future.[215]

In Western countries, more and more people on a spiritual quest feel attracted to shamanic practices and go to distant lands to meet shamans and participate in initiation rituals. Surprisingly, individuals who do not know shamanism or are not interested in it sometimes report "shamanically-sounding" experiences. In such experiences, these individuals may feel as if they are merging with the body of an animal. In shamanism, this phenomenon is called "shamanic fusion."[216] The following account is a good example of such an experience:

I experienced my first fusion more than 10 years ago, and despite that, it remains present in my memories as if it had just happened. I also remember it as one of the most beautiful experiences I have ever had. The trigger was, however, purely accidental. At the time, I had little knowledge of fusions, so experiencing one was not my goal. I used to frequent an esoteric bookshop in the Liège region whose distinctive feature was to play a wide variety of New Age or relaxing music.

Obviously, the music was varied and one day Rudy, the vendor, had decided to play a CD by Phil Thornton titled Initiation. *Since there were only two of us in the store, the music was clearly audible, and Rudy had increased the volume.*

I found myself in front of the counter, just listening until a white flash propelled me into this desert of red-orange sand scattered with bushes. For a moment I thought: "How did I get here?", the next moment I didn't care. I felt that warm wind on my face; at that moment my place was there. I turned slowly and saw this mountain lost in the middle of nowhere. It looked like a giant had snatched the top and I knew that I had to walk towards it. I finally reached the foot of this immense red monolith. I was as happy as if I had returned home after a long trip or a long absence. I stared at the rock for several minutes; I looked at these veins and the cracks running through the stone, I found it wonderful... Then I heard the voice, I turned in its direction. The landscape changed, the plains became dunes and on one of them stood a cougar. I don't doubt for a moment that in real life, I would have fled as fast as I could. But the cougar, this cougar – words were not enough to describe it. I walked towards it and joined it on the dune. I looked into the eyes of this animal that stood there in front of me and I doubt that I will ever be able to find the words to describe what I saw there. The voice spoke to me once more and intuitively I knew it came from the cougar. These words were:

"Here you are, finally, little brother of the Earth."

I remember thinking: "It's impossible, animals don't speak," and the voice answered me:

"Indeed, I do not speak to you with words. Why speak with words when it is more beautiful to speak with the mind?"

"With the mind?" I replied. His answer was:

"Soon you'll understand."

I didn't know what to think, I told myself that I had to be dreaming. I placed my hand on him and he appeared more real than ever. I asked him:

"Why am I here?" And I already knew the answer he would give me.

"To learn, little brother. To live, little brother."

Questions were jostling around in my head.

"Why do you call me little brother?" He answered me:

"Under this skin there's flesh and under this flesh there's blood just

as under your skin. In my chest beats a heart, just as in your chest. If you pierce this flesh, like you I feel pain. The blood that flows will not be less red than your blood. Break this heart and like you, little brother, I will suffer. Come, let's walk!"

We walked for a while and went back to the plains because it was hard for me to follow the cougar in the sand. We walked in silence, in the beauty of silence. Back on the plain, the cougar told me:

"Come on, little brother, let's run! Let the wind caress you, listen to it sing..."

We started running and I was quickly left behind. The cougar stopped to wait for me and once I joined him, he asked me to forgive him for running faster than me.

"You're not capable of running like a cougar, you're still young in your learning process, I should have taken this into account. You cannot run like a cougar, so you have to become the cougar..." he told me.

I felt myself becoming light, misty.

A few moments later, I was inside the cougar. I had merged with him, I was in him and I saw through these eyes like a spectator. I could still hear his thoughts. He explained to me that he had fused our two beings, and that in due course, he would teach me how to achieve this too. The cougar resumed his run and we ran a long time on the plain, although I was only a spectator in this body which did not belong to me, I could feel muscles (which I did not have) working, fill with blood, contract and soften as the heat spread to these muscles. I found this feeling to be wonderful.

We heard a scream; the cougar stopped and looked up. An eagle hovered high in the sky. The cougar explained to me that it was another of my brothers, a bird of power as he himself was an ally, an animal of power. I thought it must be as wonderful to hover in the immensity of the sky as to run on the plains. As if he was still openly reading my mind, the cougar then told me, amused:

"Find out for yourself!"

I felt that I was leaving the cougar's body and my spirit was rising towards the eagle and I ended up fusing with the eagle as I had done with the cougar. My perceptions changed again, and I could see my feline friend running in the plains. I felt the wind caress the feathers; I even felt the currents ascending and descending... I was flying! The eagle asked

me if I liked these sensations. I was so drunk by the speed and the multitude of new feelings that I did not know what to answer.

Sadly enough, we ended up landing not far from the cougar.

"Unfortunately, we each have to go our way, little brother."

I was terribly sad to hear that, and he must have felt this sadness because he added:

"Do not be sad, it's not an ending, or a goodbye. It's a beginning; the road is long, we have taken only one step and there are a thousand left." I asked him:

"When can I see you again?"

He replied:

"I'm always by your side, whether you can see me or not. See you soon."

Before I had time to say anything, I found myself in front of the counter again facing my friend Rudy. He knew that something had happened and told me that I had seemed completely absent for quite some time. He said that he had felt he was in front of an empty vessel, facing a soulless body. He had even been worried that I would faint. I was experiencing some kind of emotion and I started crying with joy, stammering in the eagerness of what I had to tell him... But tell him what? A dream? A vision? What exactly had I experienced?[217]

Spiritual and shamanic experiences can also result from taking entheogens (this term means "generating the divine on the inside"). I can personally attest to the fact that at the subjective level, the entheogens – also called psychedelics – lead to spiritual experiences similar to mystical states associated with spiritual practices or occurring apparently spontaneously. For Stanislav Grof, a psychiatrist who has worked with these substances and is one of the fathers of transpersonal psychology, entheogens (e.g., mescaline, psilocybin, ayahuasca, and LSD) appear to act as catalysts/amplifiers allowing deepest levels of the *psyche* to manifest.[218]

Entheogens may induce experiences in which the little self (which some philosophical and spiritual schools call the "ego") of the experiencer is transcended and this experiencer merges with an infinitely wider Consciousness which is also full of Wisdom and Love. These inexpressible experiences, which appear more "real than reality," are frequently

accompanied by feelings of intense peace and happiness. In the long run, entheogenic experiences can reduce egocentric motivations (e.g., desire for power and fame) and foster a personal transformation that includes social and ecological awareness.[219]

One of the most popular entheogens is ayahuasca. This drink concocted from lianas – which contains DMT, a powerful psychotropic drug – has been used for a very long time by the shamans of the Indian tribes of Amazonia. Generally, ayahuasca consumption is portrayed by its users as an intense and positive experience that allows for a new understanding of life, the world, and the self. The use of this entheogen also improves interpersonal relationships and promotes a change in values as well as a new relationship with nature. Taking ayahuasca also promotes spiritual development.[220]

The following is the story of a Westerner, Marie-Claude, who went to the Amazon rainforest to experience this entheogen under the supervision of a shaman named Ricardo:

> *All fears fled when I met Ricardo, a man full of wisdom and joy; trust was established. His radiant face seemed to me full of certainty, so what good was it to fight. I knew that nothing could happen to me if not a wonderful journey still clinging to me, with its roots deeply set inside me. The sacred ceremony could begin, I trusted him completely and I knew that my only reason was to live this precious moment in the abandonment of myself.*
>
> *From another time, with the seal of his gaze on me, I was already beginning to center myself. A moment of well-being in the sharing of the circle. The ritual could begin, I knew that another reality would be offered to my soul [...]. It was the plant's turn (ayahuasca). Its bitter taste seeped into me, and there, I began to speak to it, asking it to be sweet with me and to lead me to my reality and that, thus, I would follow it. In fact, I wanted it to show me the way and that's what it did, and this is how. In harmony with the sweet melody of Ricardo's voice [...], it was not long before I departed [...] – it was directing me, and I felt it immediately throughout my body. It passed with extreme rapidity along my spine, making me feel every vibration, every bone; life vibrated within me. Everything resonated in me. I felt my organs; each passage released a pent-up tension. I had the feeling of being delivered from the weight of*

constraints. I felt light. My body did not belong to me anymore, or at least, I did not control it any more. The plant had literally tied me up, I was its prisoner, I could not move. I told it OK, that's what you want then I'll let you be the master of my soul, I'll be your student, teach me. Then, suddenly, the speed increased, a bright field offered itself to me [...] The lights [...] filled my head, bursting inside me [...].

I will not dwell on my vomiting bouts (so much to get out of my body). The doubts, the fears clogged in my unconscious – this precious well, it had to spit out its venom. No time to dwell on my flaws – because I yearned to learn, know and explore. I had hardly asked that, quickly and efficiently, my wish was fulfilled, and I received the revelation. Stars swept, with an intense luminosity that I absorbed – it seemed as if they came to die inside me and suddenly reappeared through an angle of my vision, a column of hands joined together in a circle [...]. Then on that foggy background stood a cross, so luminous that I could not take my eyes off it. A cobra was curled up around the cross and long plants with extremely thin stems spread out to ultimately hatch into exquisite silver filaments. These filaments urged me to look ever further as if the infinite belonged to me, as if only I could set the limits of my possibilities.

For a moment, I heard Ricardo's voice singing, I know I knew a few lyrics to that song, for I remember saying it at the same time as him, as if I was familiar with his knowledge.

In my quest, an elderly woman with dark, wrinkly skin, extraordinarily powerful black eyes, a wide mouth, and gaping teeth began to smile at me and talk to me. She motioned me to follow her; at that moment I felt I was leaving my body. I went on a journey with her over a nebulous opaque space, and suddenly a circle centered in an immense rectangle appeared to me; this circle was turning in arabesques. It represented the center of the universe. I plunged into its center and there I discovered a green hill where luminous triangles (three at the top and two at the bottom in staggered rows) showed me the way, their light traced an arrow like the indication of a road to follow, which I did and there again this woman showed me an enormous and very old lock, and said to me: "Open it, you have the key." That's what I did, the door was heavy, but on the other side the light was blinding. There, many radiant entities of light smiled at me with happiness and joy, everything was calm, relaxing, with the extremely colorful and luxuriant nature.

Suddenly, I felt the sensation of returning to my body with a jolt and hearing the circle again. I know that at some point I started talking to some of my neighbors, telepathically, of course. Ricardo, for a long time, officiated in the circle, I know that I could not look at him, with his vibratory field so intensely radiant that he was blinding me. Others were releasing their woes – this dual sensation of being both present and absent, but of sharing a communion, of feeling the warmth of this circle. It was wonderful when Ricardo approached me to care for me. I felt his extreme strength and sweetness on my fontanel, my eyes filled with tears and sobs rocked my body. The feeling of being protected, rocked even if all this was accompanied by vomiting, but again, I knew it was necessary, his hand purified me. After that, I could indulge in my visions without restraint. I left accompanied by a crowd of animals – they were all looking at me with their eyes sparkling. One of them, a wolf, crouched in front of me. Nature offered itself without restraint. I explored it and an infinite chatter of trees filled my left ear. It was very irritating because I did not understand their language, but I can tell you that it was incessant; they were real gossips. On the right, I was talking to the entities. Suddenly, I was projected with a breathtaking speed towards the summits in a dizzying ascent. A huge net, with very large, silvery stitches, stopped me. I could get through and at the same time I could not, as if a border was denying me access. I came down again and I felt as if I was in a futuristic city, judging by the size of its houses. Several times, I saw an apartment with a large terrace further back, at the top of a building that was at the corner of a street. Once, I entered an old house. The lobby was large, like that of a castle and the stairs were made of stone and the walls were greyish green. As I climbed, I looked at a gallery of family portraits, and when I reached the landing, they faded from my view to make way for a small door at the bottom of the gallery. So, I started shouting, "No!" Twice I came back to this scene. I was paralyzed. An important thing too – I needed to inhale, to breathe, to fill my lungs with air from elsewhere, but I don't know how to explain that, because I had the feeling that it was vital. To take in, at all costs, this new air, to fill me with it. To be honest, it took me six days to realize the necessity to feed myself. And yet, I love food, but it felt useless. There was the feeling of already being nourished. Other visions came to fill my soul, but the most vivid ones are those that I express here. My body and my mind have long benefited from the effects

of the plant, a healthy well-being.[221]

Although Marie-Claude's experience reported here was very positive overall, I do not want to give the reader the impression that the use of entheogens is completely safe. In fact, taking these substances can cause reactions of fear or panic (*bad trip*) throughout their active duration. Using entheogens can also cause long-term perceptual disturbances, as well as precipitate or exacerbate symptoms associated with mental disorders.[222]

Spirituality and Health

Unsurprisingly, materialist neurologists and neuroscientists do not hesitate to "pathologize" spirituality and SEs. Some of them have stated that electrical disturbances of the temporal lobes of the brain – located on either side of the skull, just above the ears – play a significant role in SEs. According to this hypothesis, the temporal lobe would act as the "module" of SEs in the brain, and epileptic seizures located in this structure could induce this type of experience.[223] This hypothesis suffers from some major weaknesses: on the one hand, surveys conducted in several countries reveal that SEs are frequently reported by individuals who do not suffer from an abnormality such as temporal lobe epilepsy (TLE). On the other hand, it is extremely rare for people with TLE to report SEs. If TLE actually causes SEs, all those who suffer from this neurological disorder would have such experiences.

This does not mean, however, that the temporal lobe is not involved in the cerebral mediation of spiritual and mystical experiences. In this regard, some neuroimaging studies conducted in my laboratory suggest that the temporal lobe actually plays a role in the perception of contact with a spiritual dimension. The results of these studies, however, indicate that other brain regions involved in perception, positive emotions, representation of the body in space and self-awareness, are also correlated with SEs. Therefore, there is not a single "point of God" (or module of spirituality) in the temporal lobe.[224]

Neurologists and neuroscientists are not the only ones who have attempted to pathologize SEs. During the second half of the nineteenth century and much of twentieth century, some psychiatrists and psychoanalysts tried to do the same by suggesting that SEs were symptoms associated with mental disorders resulting, for example, from abnormal psychological defenses or an immature personality.[225] However, contrary to

what these psychiatrists and psychoanalysts believed, a growing body of scientific evidence shows that SEs and spirituality have several beneficial effects. Indeed, these data indicate that a higher level of spirituality is associated with better mental health, greater well-being, better quality of life, higher self-esteem, more optimism, and higher longevity. In addition, a higher level of spirituality is associated with lower rates of stress and anxiety, depression, alcoholism, substance abuse, and suicide.[226]

The Inner Connection

My research about the neurobiological correlates of spiritual and mystical experiences has received international media coverage. In this context, journalists have often asked me how the identification of brain regions associated with such experiences could be useful to the average person. After being asked that very legitimate question a few times, I started to reflect on how to allow people who are not experts in contemplation to reach a state of consciousness allowing them to get in touch with their spiritual essence.

During my reflection, it occurred to me that brainwave entrainment could be an interesting way. This concept refers to the fact that the frequency of brainwaves can synchronize, through a resonance effect, with the frequency of an external stimulus, for example a sound.[227] In order to change the frequency of brainwaves, we can use so-called “isochronic” sounds. These sounds are regular beats of a single tone. In other words, an isochronic sound is a tone that fades and reappears quickly at regular intervals. This creates distinct and precisely defined sound pulsations, which are similar to the beat of a drum. These isochronic sounds can be used to accelerate or slow down the frequency of brainwaves.

When we change the frequency of brainwaves, we automatically bring a modification to the state of consciousness and a momentary change of the sense of identity. Based on this principle and some pilot studies carried out in my laboratory, I decided a few years ago to embed isochronic sounds of specific frequencies in some musical frames designed for relaxation and meditation.[228] These preliminary studies have shown that SEs and contact with spiritual planes are associated with a significant slowdown in the frequency of neuroelectric activity relative to normal waking consciousness.[229] These studies also revealed that infrasounds, sounds whose frequency are less than 15-20 Hz, which are not perceptible consciously, can modulate the frequency of brainwaves.

Using this technique of nesting isochronic sounds in musical frames, I created a psychospiritual approach titled "*The Inner Connection: A Conscious Re/Creation*." In the initial phase of developing this approach, I used this technique to help, individually or in small groups (in the form of workshops), individuals interested in personal and spiritual growth to enter into a broader state of consciousness. Isochronic sounds, whose frequencies correspond largely to those of slow waves (theta and delta), were used.[230] The results of this work have shown that at the sense of identity level, this expanded state of consciousness allows a passage of "little self" (also called the ego or the superficial self) to a "Big Self" (also named Higher Self or Ego). In the state of the Big Self, which corresponds to the spiritual part of the *psyche* (or supraconsciousness), it becomes easier to free oneself from limiting beliefs, negative emotional patterns, and inner wounds. The state of the Big Self also allows us to intuitively receive information that can be related to, for example, the life plan or what appears to be "past lives." This state also allows us to experience spiritual love and to generate new experiences and realities.

Frequently, individuals in this state realize that everything is fine – even what appears to their little self as serious problems (for example, a life-threatening illness such as cancer) – and that we must trust in life, let go, and surrender ourselves to our spiritual essence. There is also an awareness that the little self is transient and malleable.

With regard to emotion, the state of the Big Self is associated with well-being, peace, lightness, and joy. At the energy level, individuals in this state often feel a subtle energy entering the heart region and/or the "crown chakra." They can also perceive waves of energy circulating in the physical body, which can lead to an ecstatic reaction. Individuals in this state sometimes also claim they meet spiritual guides; in other cases, they have the impression of merging with their Big Self.

Conclusion: The Emergence of Postmaterialist Science

The architecture of the universe is consistent with the hypothesis that the mind plays an essential role in its functioning.
Freeman Dyson

What We Learned in this Book

I have tried to consider all the research in this book that informs us about consciousness and mind-brain relationships. As the reader will have noted, the empirical evidence in this research reveals that the old materialist paradigm is too restrictive: undoubtedly we need an expanded scientific model of reality.

In the first chapter, we have seen that intentions, beliefs, and emotions greatly influence brain activity, as well as that of genes and the physiological systems (endocrine, immune, cardiovascular, etc.) connected to the nervous system. Hence, mental activity plays a significant role in our health and well-being. All this shows that we are not biological machines ("meat puppets") totally defined by our brains, our genes, and our environment.

Our mental abilities are not limited to the confines of our bodies since, as I indicated in Chapter 2, we can capture information without using our ordinary senses, in ways that transcend the usual constraints of space and time. The studies discussed in the following chapter indicate that intention can even remotely affect the wave function in quantum mechanics (QM), the activity of random number generators and other electronic devices, as well as the structure of crystals of water molecules. In Chapter 4, we have seen that the human mind can also deliberately influence biological systems, such as plants, enzymes, and the physiological activity of others.

In addition, I have demonstrated that individuals may have true perceptions – corroborated by independent witnesses – during a state of clinical death triggered by cardiac arrest. These individuals can also live deep

transcendent experiences while they are clinically dead. These data strongly suggest the continuity of consciousness and personality after death, as well as the existence of nonphysical domains of reality. The evidence presented in Chapter 6 concerning communication with the deceased, induced post-mortem communication, scientific studies on mediums, and instrumental transcommunication reinforce the notion of survival of consciousness after death. Scientific research on reincarnation, and Michael Newton's work on Life Between Lives (presented in the chapter that followed) are also along the same lines.

Finally, in Chapter 8, I discussed the expansions of the field of consciousness that are associated with transcendent experiences. As I have shown, these experiences can occur spontaneously. They can also occur following a "rise" in kundalini, in a shamanic context or in conjunction with the taking of entheogens. Whatever the trigger, these experiences support the idea that we are much more than our physical bodies.

Pseudo-skeptics, who try to pose as genuine skeptics to the general public, will claim that the empirical evidence presented in this book can be explained by physical mechanisms, and that they do not question the materialist worldview. What is essential here is that these pseudo-skeptics have absolutely nothing in common with genuine skeptics. Unbiased, they conduct investigations and research with an open and objective mind, because they are motivated by a desire for understanding and knowledge, as well as the search for truth. True skeptics also take into account all the evidence. Using critical thinking and rational analysis, they question the facts and their interpretations. They are cognitively supple and do not jump to hasty conclusions; they are ready to question their own beliefs, as well as to adjust their hypotheses according to new discoveries.

Pseudo-skeptics, as for them, are fundamentalists engaged in a crusade to defend the materialist doctrine at any price. Thus, these "fundamaterialists" gathered to conduct a guerrilla on Wikipedia: they managed to infiltrate this online encyclopedia. Working in teams and using pseudonyms, they make sure that this online encyclopedia presents research on psi phenomena, as well as some aspects of research on alternative and complementary medicine, as pseudoscience. These fundamaterialists also manipulate the biographical pages of the researchers involved in this research.[231]

Pseudo-skeptics present themselves as defenders of critical thought, logic, and reason. With a closed mind, they are not interested in facts and truth.

Thus, they do not seek to examine the evidence or conduct experiments. Moreover, they deny all the evidences that are not compatible with the materialist doctrine or they try to convince that, sooner or later, physical explanations will make it possible to demystify all the empirical data. Intellectually dishonest, they do not hesitate to lie and resort to disinformation, as well as to attack scientists whose work demonstrates the erroneous nature of their sacrosanct doctrine. What is most pathetic is that despite these, pseudo-skeptics claim to know what is true and what is false, what is possible and what is not. Ultimately, they seek mental control of the population.

The Structure of Scientific Revolutions

In 1962, historian and philosopher of science Thomas Kuhn published a book titled *The Structure of Scientific Revolutions*[232] which became very influential in the academic world and some popular circles. In this book, Kuhn proposes that paradigms – the theoretical frameworks of scientific disciplines within which theories are formulated, and the experiments conducted – can and must change because sooner or later they will no longer be able to explain the phenomena that are observed. Kuhn also demonstrates that scientists are generally unable to recognize the existence of phenomena that are not allowed by the paradigm to which they adhere. In this respect, he cites the following example: it was not until Copernicus proposed a new astronomical paradigm that astronomers in the Western world could see that the heavens were not unalterable. While Chinese astronomers, whose cosmic beliefs did not exclude celestial changes, had noted the appearance of new stars in the heavens long ago.

According to Thomas Kuhn, when anomalies accumulate – experimental observations or other empirical evidence that violate the widely accepted theoretical framework – and the persistent efforts of researchers to elucidate these anomalies fail, the scientific community begins to lose confidence in this paradigm and a period of crisis ensues: a new paradigm, which competes with the old dominant paradigm, can now be considered. This new paradigm, which is not at all an extension of the old paradigm, represents a totally different view of the world.

Typically, daring and visionary scientists champion the new paradigm, and attack the old theoretical framework. Unsurprisingly, as conservative scientists believe that anomalies will soon be resolved by the old paradigm,

they are struggling to save the old theoretical framework. However, if the new paradigm is sufficiently promising, i.e., if it is better able to explain the anomalies in question, then a significant number of scientists are moving away from the old paradigm, and a change of paradigm (or a scientific revolution) occurs. Following this paradigm shift, researchers are returning to a period of normal science, and they are trying to solve problems by staying within the new theoretical framework.

The Copernican Revolution – a radical reversal of the representation of the world – is a very good example of a major paradigm shift: Ptolemy's current geocentric model was followed by a heliocentric model championed by Nicolaus Copernicus. This model was then perfected by Kepler, Galileo, and Newton. Remarkably, Aristarchus of Samos, a Greek mathematician and astronomer of the third century BCE, hypothesized that the Earth turns on itself and moves in a circle with the Sun as center. But since the vast majority of astronomers adhered to geocentrism, it was not until eighteen centuries before Copernicus proposed his revolutionary model.

Another example of a major paradigm shift in science is the development of QM between 1900 and 1930. This new physics emerged as mathematical explanations for certain anomalies at the atomic level that were not compatible with the prevailing theories of classical physics.

Current scientists doing research related to consciousness and mind-brain relationships are in a similar situation as that of physicists at the very beginning of the twentieth century. They are faced with an ever-increasing number of anomalies that cannot be elucidated within the framework of materialist theories.

A Personal View of the Postmaterialist Paradigm

The empirical evidence discussed throughout this book tells us that now is the time to get rid of the materialistic shackles and expand our understanding of reality.

Even though we do not have all the answers to our questions yet, regarding consciousness and mind-brain relationships, we can still present some key elements of the postmaterialist paradigm.

One of these key elements is the following: the mind is irreducible to physical processes, and its ontological status is just as important as that of matter, energy, and space-time. In other words, mind does not come from matter, and it cannot be reduced to something more fundamental. In this

regard, the philosopher David Chalmers[233] and the physicist and cosmologist Andrei Linde[234] postulated that consciousness, one of the main functions of the mind, is a fundamental component of the universe.

This element of the postmaterialist paradigm is based on the undeniable fact that consciousness is a prerequisite for reality. Indeed, the physical and mental aspects of reality are subjectively experienced through consciousness. Without it, it would be impossible for us to appreciate the musical genius of Mozart or the exquisite taste of Dom Perignon champagne; and there would be no sense of identity or apprehension of the world. On the other hand, it is becoming increasingly clear that the concept of mind is absolutely necessary in order to understand the universe more accurately, be it at the micro physical level (for example, the effect of the observer in QM) or at a more macroscopic level (for example, mental influence on brain activity and behavior).

If the mind is primordial, then it is conceivable that mental processes and events, including subjective interiority, exist at the various levels of organization in the universe and that they do not absolutely require a nervous system to operate. In this respect, theoretical physicist and mathematician Freeman Dyson proposed that since atoms behave in the laboratory as active agents rather than as inanimate matter, they must possess the ability to make choices.[235]

At the molecular level, there is evidence to suggest that molecules composed of only a few simple proteins are capable of complex interaction, as if they had a mind.[236] Environmental awareness and intentionality also appear to be present in unicellular and multicellular primitive species.[237] Thus, the amoeba lives as a unicellular being most of its life. When it needs food, however, it transmits signals to other amoebae nearby. Thousands of individual amoebae then come together and morph into a much larger entity that has new capabilities, such as the ability to move on the forest floor. Members of this larger entity release spores from which new amoebae are formed when they reach a better feeding area.[238]

As suggested by author Duane Elgin,[239] there may be a spectrum of consciousness that encompasses several levels, for example the atomic, cellular, and human levels. All levels would show a certain degree of awareness and intentionality. These abilities would make it possible to perceive but also to manipulate the environment. Mental processes and the *qualia* would be more refined in more complex beings.

Another central aspect of the postmaterialist paradigm is the deep interconnection that exists between the mental world (*psyche*) and the physical world (*physis*). Our usual perception of reality gives us the impression that *psyche* and *physis* are separated, but psi phenomena demonstrate that they are intimately linked. As Carl Gustav Jung and Wolfgang Pauli, who spoke about the *unus mundus* (the "One World"), I firmly believe that *psyche* and *physis* are closely related because they originate from a common principle: they are complementary aspects and manifestations of an indivisible whole that we can refer to as "Reality." For me, this first principle is a transcendental Consciousness that is also immanent, that is, ubiquitous in nature. Transcending energy, matter, space-time, and the world of the psyche, this Consciousness guides the unfolding of the physical and nonphysical worlds.

It is this indivisibility of *psyche* and *physis* that enables the mind to influence physical and biological phenomena. The remote mental interaction with physical systems or living organisms suggests that the unconscious part of the mind communicates – exchanges mental information capable of triggering action – with the physical world. On the other hand, telepathic experiences indicate that there are mental connections, usually unconscious, among human beings. The deep interconnection between *psyche* and *physis* does not seem to be based on quantum entanglement. Indeed, non-local connections between entangled particles do not imply transfer of information[240] while mental interactions between humans, or remote mental influence on physical systems and living organisms, seem to involve an exchange of information implicating mental phenomena that are not taken into account in QM.

In addition to allowing us to subjectively experience our internal environment (psychic) and our external environment (located outside our physical body), the mind acts as a force – it has the ability to affect the state of the physical world. This observation is another key element in the postmaterialist paradigm. As we have seen, the mind influences the activity of the brain and physiological systems connected to the nervous system, as well as the activity of the genes. I have hypothesized that this psychosomatic influence is implemented neurobiologically by a process of psychoneural transduction: in this context, a transduction is a transformation of one form of information into another.[241] According to this hypothesis, mental processes (conscious and unconscious) are translated into neuronal processes, at various

levels of brain organization (for example, molecular, chemical, and electrical). In a metaphorical way, we can say that the *mentalese* (the language of the mind) is translated into *neuronese* (the language of the brain). Thus, negative thoughts increase the secretion of cortisol while pleasant thoughts elevate the secretion of endorphins. The resulting neural processes are then translated into processes/ events in other physiological systems, such as the immune system or the endocrine system.

As I have shown in this book, in addition to its psychosomatic influence, the mind also has a non-local effect, beyond the limits of the body. In both cases (psychosomatic action and non-local influence), information, which does not depend on time or space, and information transduction, seem to play an essential role. On this subject, physicist David Bohm posited that there is a kind of active information in nature that makes the connection between the mental world and the physical world possible. The American physicist John Wheeler also believed that the universe was created by information.

As part of the *Theory of Psychelementarity*, which I proposed a few years ago,[242] I posited that the mind's ability to act as a force, whether somatic or exosomatic (non-local), varies among individuals. In order to be able to exert a greater force, the mind must be focused as a laser beam, rather than as a diffuse light. Rigorous mental training heightens this ability. Hence, some meditation techniques aimed at developing intentionally sustained concentration with respect to a specific object. According to the Theory of Psychelementarity, such training allows the mind to produce a greater mental strength.

If the mind is essential and cannot be reduced to matter, so what is the role of the brain? According to the postmaterialist paradigm, this organ acts as a filter and an interface for the mind. The hypothesis that the brain acts as a filter (or a "reduction valve") is not recent because it was proposed more than a century ago by philosophers Henri Bergson and Ferdinand Schiller, and psychology researchers William James and Frederic Myers.[243] This hypothesis was later taken up by author Aldous Huxley. Accordingly, the brain would normally limit access to expanded states of consciousness, and from an evolutionary point of view, this function would promote biological survival. During transcendent experiences, this filter function would be disabled to varying degrees. On a subjective level, such a deactivation would make it possible to experience domains of reality that are not physical.

Materialists claim that the fact that mental functions are disturbed when

the brain is affected proves that this organ produces the mind. This is inaccurate because, as William James correctly noted, the hypothesis that the brain acts as a “transmitter” of the mind is also compatible with this fact. Rich mental experiences as well as confirmed perceptions occurring in a state of clinical death strongly support this hypothesis.

In order to understand the nature of mind-brain relationships, we can use television as an analogy. The TV receiver receives electromagnetic signals from a television station: these signals constitute the program. These electromagnetic signals are converted by the TV receiver into images and sounds. When an electronic component which is inside the receiver breaks, this can result in distortion, or even the total loss of the pictures and/or sounds because the receiver’s capacity to receive or decode the electromagnetic signals is disturbed. Does this mean that the program is created by the TV receiver? Absolutely not. Similarly, mental functions cannot be reduced to the activity of brain regions and circuits.

In the context of the notion of the brain as a filter and the analogy of the TV, transcendent experiences could be compared to the temporary reception of higher frequencies. As a result, our field of perception and experience widens: the invisible becomes visible, and new aspects of reality are revealed to us.

The Next Great Scientific Revolution

The implications of the postmaterialist paradigm are numerous and crucial. Thus, this new theoretical framework fundamentally changes the vision we have of ourselves, and it gives us back dignity and power as human beings by inviting us to develop the various aspects of our potential. The postmaterialist paradigm also encourages positive values such as respect, compassion, cooperation, and peace. In addition, by emphasizing the intimate connection between ourselves and nature, this paradigm encourages environmental awareness and the preservation of our biosphere.

The history of science has been punctuated by some special moments that have led to major paradigm shifts. Let’s consider, for example, the transition from flat Earth theory to the conception of spherical Earth. Or that of geocentrism to heliocentrism.[244] It seems that we are now approaching another crucial paradigm shift – the transition from materialist science to postmaterialist science.

Far be it from me to play the prophet. However, I am deeply convinced

that this transition will lead us to the next great scientific revolution, and that it will be even more vital for the evolution of human civilization than was the Copernican revolution. This revolution, which will affect our scientific understanding of the mind and its capabilities, will lead to a profound transformation of all aspects of life on Gaia – our wonderful planet, blue pearl floating in the immensity of space.

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